OM-218 029 920AD

2011–07

Processes

TIG (GTAW) Welding

Stick (SMAW) Welding

Air Carbon Arc (CAC-A) Cutting and Gouging

With Optional Equipment:

MIG (GMAW) Welding

Flux Cored (FCAW) Welding

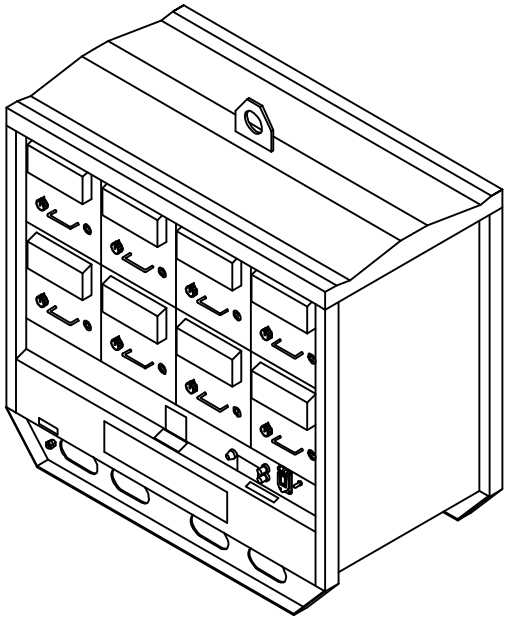
Air Plasma Cutting and Gouging

Description

CC DC 3 Phase

Arc Welding Power Source

MARK VIII®-2



OWNER'S MANUAL

Visit our website at

www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

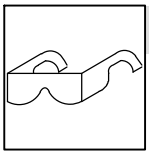
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off compressed gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct compressed gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

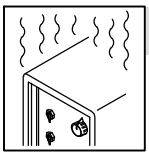
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

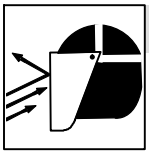
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.



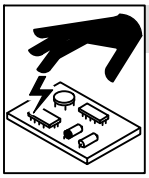
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can injure.

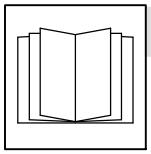
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

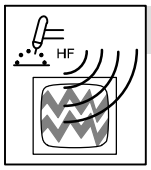
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers–by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

2-1. Symboles utilisés

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

***NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

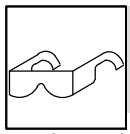
Le rayonnement de l'arc du procédé de soudag génère des rayons visibles et invisibles intense (ultraviolets et infrarouges) susceptibles de provoquer des brûlure dans les yeux et sur la peau. Des étincelles sont projetées pendant l soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz comprimé en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.

LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Les bouteilles de gaz comprimé contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

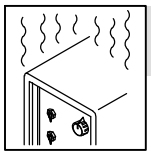
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

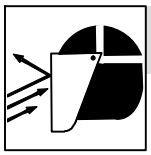
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



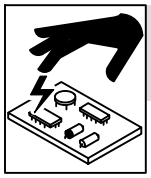
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

Les PIÈCES MOBILES peuvent causer des blessures.

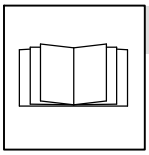
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

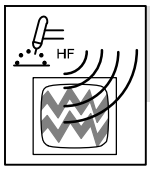
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



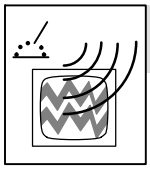
LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

⚠ Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)

⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.

⚠ Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.*

Pour les moteurs à essence :

⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, Quincy, MA 02269 (téléphone : 800-344-3555, site Internet : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (téléphone : 703-788-2700, site Internet : www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (téléphone : 800-463-6727, site internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux–le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (téléphone : 301-504-7923, site internet : www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (télé[hone : 1-800-232-4636, site internet: www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – SPECIFICATIONS

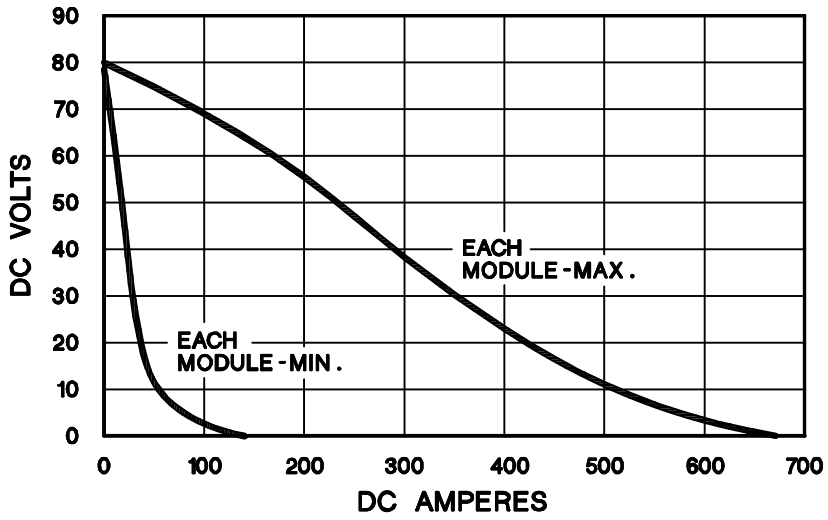
3-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the front. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

3-2. Specifications

Rated Welding Output For Main Transformer	Rated Welding Output For Each Module	Max OCV DC	Amperes Input at Rated Load Output, 60 Hz, Three-Phase							
			220 V	230 V	380 V	440 V	460 V	575 V	KVA	KW
800 A @ 40 Volts DC, 100% Duty Cycle; 1600 A @ 40 Volts DC, 25% Duty Cycle	200 A @ 40 Volts DC, 60% Duty Cycle	80	178 8*	170 8*	103 5*	89 4*	85 4*	68 3.2*	68 3.18*	48.6 2.65*
*While idling										

3-3. Volt-Ampere Curves

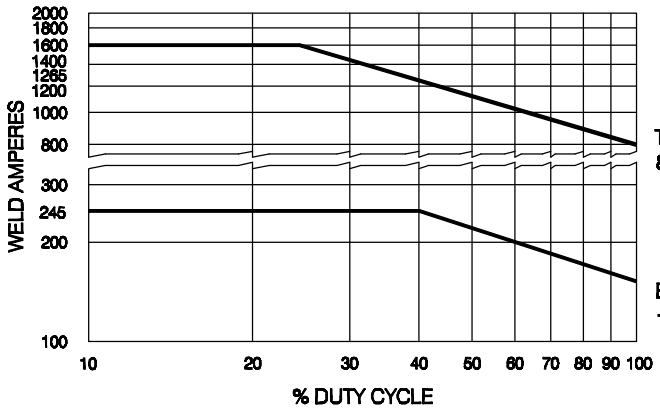


The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of each module. Curves of other settings fall between the curves shown.

ssb1.1* 10/91 – 083 110-C

3-4. Duty Cycle And Overheating

For Each Module And Total System

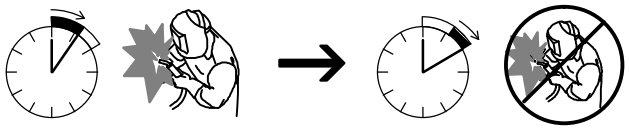


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or duty cycle before welding.

NOTICE – *Exceeding duty cycle can damage unit or gun and void warranty.*

60% Duty Cycle At 200 Amperes



6 Minutes Welding — 4 Minutes Resting

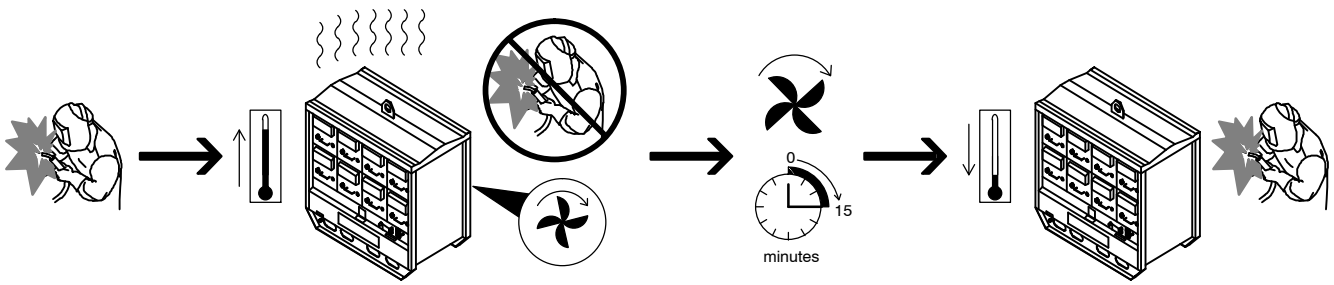
For Main Transformer

The main transformer of the polyweld system has dual duty cycle ratings, each for a specific amperage output range. If the unit is operated in the 800 ampere range, the unit is rated at 100% duty cycle. This means the polyweld system can be operated at 800 amperes continuously. When the unit is operated in the 1600 ampere range, it is rated at 25% duty cycle.

The sum of the outputs of each module should not exceed the rated duty cycle of the main transformer. For example, the polyweld system can be safely operated at a load of 1000 amperes at 60 percent duty cycle. This value could be obtained by operating five modules at a load of 200 amperes at 60 percent duty cycle, or by operating eight modules at a load of 125 amperes at 60 percent duty cycle.

Overheating

Thermostat TP1 protects the polyweld system. If main transformer T1 gets too hot, TP1 opens and weld output stops. The stabilizer in each of the eight modules is protected from overheating by thermostat TPX1 (“X” represents the number of the applicable module, 1–8). If overheating of a stabilizer occurs, the associated thermostat opens, reducing weld output to a minimum that cannot be regulated. The fans keep running to cool the stabilizer. Wait several minutes before trying to weld.



When overheated, thermostat opens, output decreases or stops, and cooling fans keep running.

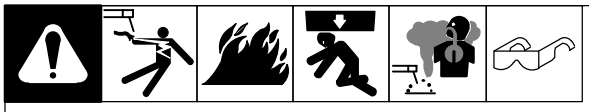
Let fans run for 15 minutes.

Start welding.

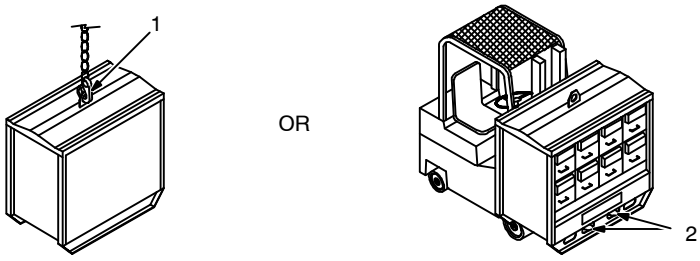
ssb10.1* 1/94 – 002 919-C / 144 567-A

SECTION 4 – INSTALLATION

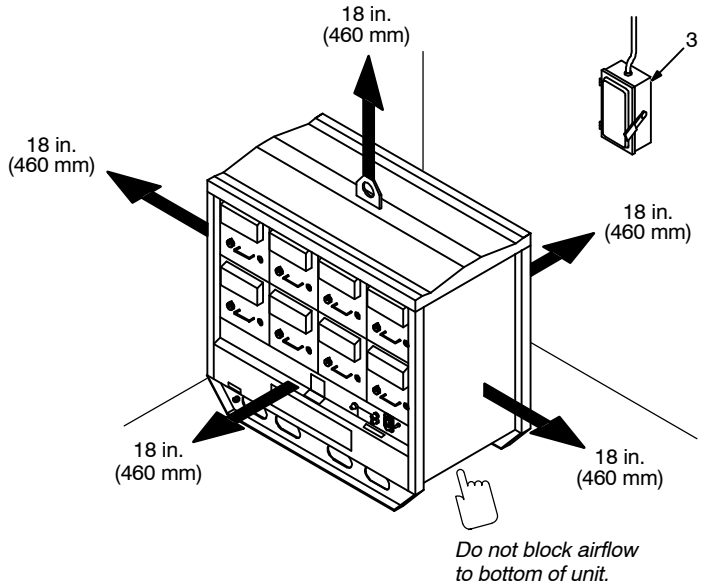
4-1. Selecting A Location And Moving Polyweld System



Movement



Location And Airflow



Disconnect input power conductors from deenergized supply BEFORE moving polyweld system.

1 Lifting Eye

2 Lifting Forks

Use lifting eye or lifting forks to move unit.

If using lifting forks, extend forks beyond opposite side of unit.

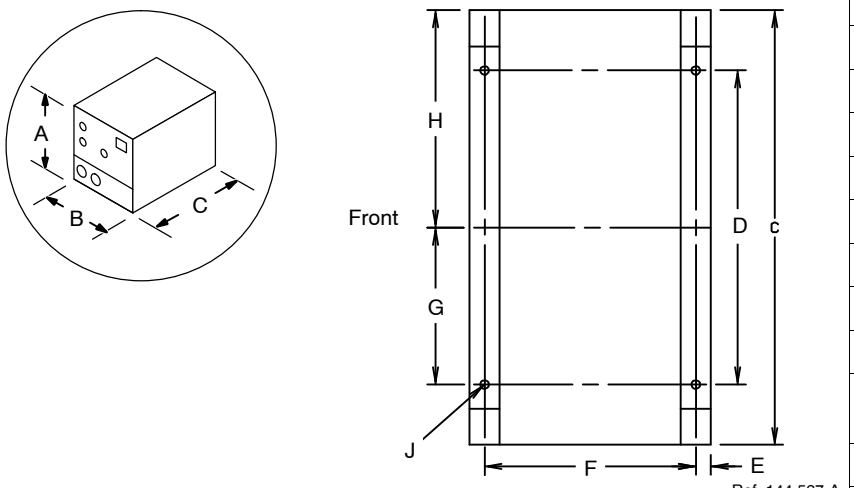
3 Line Disconnect Device

Locate unit near correct input power supply.

Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.

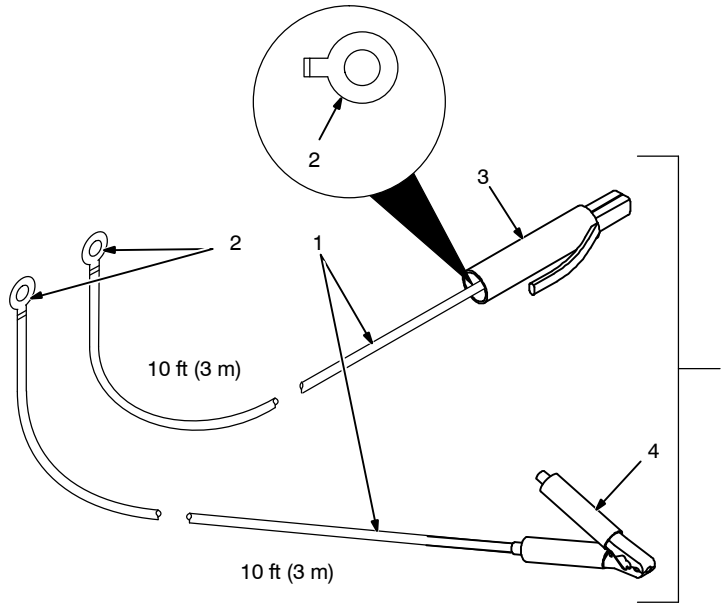
ssb9.1 5/94 – 801 180 / 144 567-A

☞ *Overall dimensions (A, B, and C) include lifting eye, handles, hardware, etc.*



Dimensions	
A	77-1/4 in. (1943 mm)
B	72 in. (1829 mm)
C	40 in. (1016 mm)
D	52-1/2 in. (1334 mm)
E	3/4 in. (19 mm)
F	38-1/2 in. (978 mm)
G	26-1/4 in. (667 mm)
H	36 in. (914 mm)
J	1/2 in. Dia. (13 mm Dia.) 4 Holes
Weight	
4050 lb (1837 kg)	

4-2. Selecting And Preparing Weld Output Cables



1 Weld Output Cable

Determine total cable length in weld circuit and maximum welding amperes. Use Section 4-3 to select proper cable size.

Use shortest cables possible.

Do not use damaged cables.

2 Terminal Lug

Use lugs of proper amperage capacity and hole size for connecting to work clamp, electrode holder, and weld output terminals.

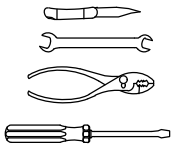
3 Insulated Electrode Holder

Install according to manufacturer's instructions.

4 Work Clamp

Install onto work cable.

Tools Needed:



sb6.1* 5/94 – Ref. 144 570-A

4-3. Weld Output Terminals And Selecting Cable Sizes*

NOTICE *– The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.*

Weld Output Terminals

Turn off power before connecting to weld output terminals.

Do not use worn, damaged, undersized, or poorly spliced cables.

Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle AWG (mm^2)	60 – 100% Duty Cycle AWG (mm^2)	10 – 100% Duty Cycle AWG (mm^2)					
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)	2x4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	2x4/0 (2x120)
500	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x3/0 (3x95)
600	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x4/0 (3x120)	3x4/0 (3x120)
700	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	3x4/0 (3x120)	3x4/0 (3x120)	4x4/0 (4x120)
800	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x4/0 (3x120)	3x4/0 (3x120)	4x4/0 (4x120)	4x4/0 (4x120)
900	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)				
1000	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)				
1250	2x3/0 (2x95)	2x4/0 (2x120)	3x3/0 (3x95)	4x3/0 (4x95)				
1500	600 (300)	750 (400)	1000 (500)	2x750 (2x400)				
1750	750 (400)	1000 (500)	2x750 (2x400)	2x1000 (2x500)				
2000	800 (400)	1000 (500)	2x750 (2x400)	2x1000 (2x500)				

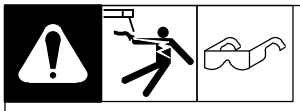
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

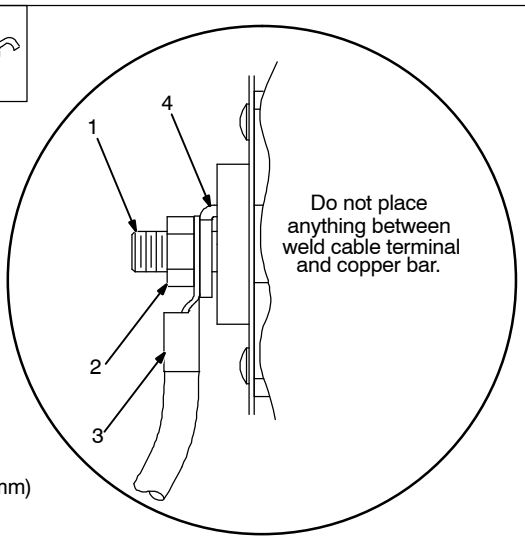
**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

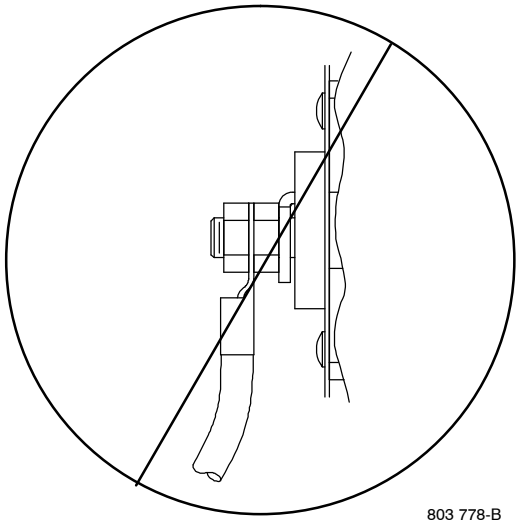
***For distances longer than those shown in this guide, call a factory applications rep. at 920-735-4505 (Miller) or 1-800-332-3281 (Hobart).

Ref. S-0007-J 2011–07

4-4. Connecting Weld Output Cables







803 778-B

Correct Installation

Incorrect Installation

Tools Needed:

3/4 in. (19 mm)

⚠ **Turn off power before connecting to weld output terminals.**

⚠ **Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.**

1 Weld Output Terminal
2 Supplied Weld Output Terminal Nut
3 Weld Cable Terminal
4 Copper Bar

Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld output terminal and secure with nut so that weld cable terminal is tight against copper bar. **Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.**

4-5. Connecting To Weld Output Terminals

⚠ WARNING

ELECTRIC SHOCK can kill; ARCING can burn skin or damage electrical connections.

- Do not touch live electrical parts.
- Turn Off polyweld system by pressing Power Off push button before making any weld output connections.
- Do not connect welding output of different polarities to the same structure.
- See ANSI Z49.1 and OSHA Title 29, Chapter XVII, Part 1910, Subpart Q (addresses at beginning of manual).
- When Positive or Negative weld output terminal is jumper linked to the Frame Connection terminal and the work cable is connected to the Common Work Connection stud on the machine base, do not connect a cable between the remaining weld output terminal and the work.
- Remove jumper link from any module where work and electrode connections are made directly to the Positive and Negative output studs.
- Do not handle or come in contact with two live electrodes at the same time.
- Connect all paralleled modules for the same polarity.

ELECTRIC SHOCK can kill; TWO TIMES NORMAL OPEN-CIRCUIT VOLTS exist between electrode holders of opposite polarity.

- Do not touch electrode holders of opposite polarity at the same time.
- Separate electrode holders of opposite polarity to prevent contact.
- Consult ANSI Z49.1 for common grounding safe practices.

A. Standard Module Connections

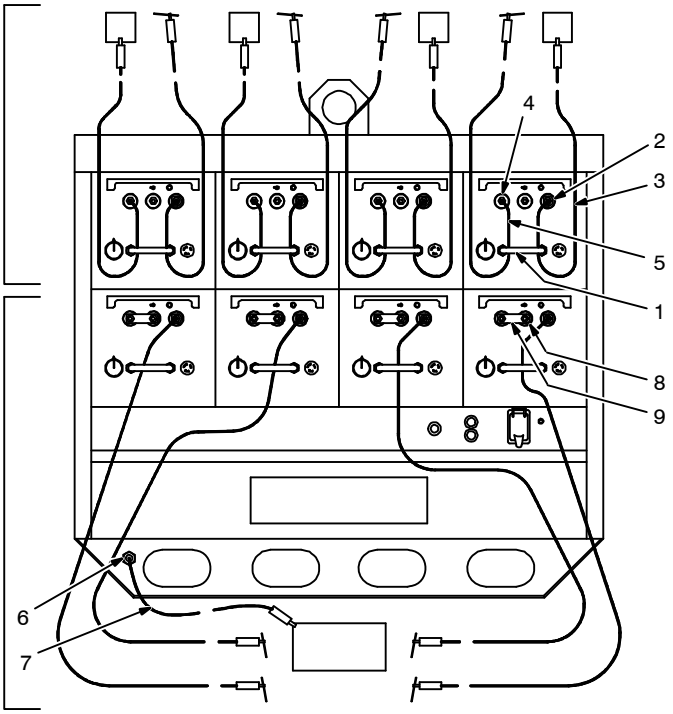
READ SAFETY BLOCKS at start of Section 4-5 before proceeding.

INADEQUATE WORK CABLE CONNECTIONS can cause serious damage to input power service and create a hazardous condition.

Connect an electrical cable of adequate size between the common work connection terminal and the workpiece whenever any module(s) is connected to use the frame connection terminal and the common work connection terminal.

Separate Work Connections

Common Work Connections



For common work connection, work cable must be able to carry combined weld output of all modules using the common work connection terminal (see Table 3-1 for proper cable size). When using the common work connection terminal, all connections to the common work connection terminal must be of the same polarity.

1 Cable Restraint

Route all cables under cable restraint.

Separate Work Connections

See Section 4-3 for proper cable size.

2 Negative (–) Weld Output Terminal

3 Work Cable

4 Positive (+) Weld Output Terminal

5 Electrode Holder Cable

For Electrode Positive (Reverse Polarity/DCEP), connect work cable to Negative (–) terminal and electrode holder cable to Positive (+) terminal.

For Electrode Negative (Straight Polarity/DCEN), reverse cable connections.

Common Work Connections

6 Common Work Connection Terminal

7 Common Work Cable

See Table 3-1 for proper cable size.

8 Frame Connection Terminal

9 Jumper Link

For Electrode Negative (Straight Polarity/DCEN), connect jumper link across Positive (+) terminal and Frame Connection terminal, and connect electrode holder to Negative (–) terminal.

For Electrode Positive (Reverse Polarity/DCEP), connect jumper link across Negative (–) terminal and Frame Connection terminal, and connect electrode holder to Positive (+) terminal.

Tools Needed:

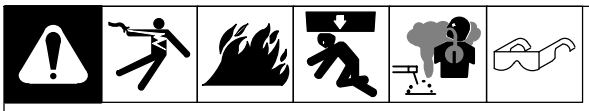
1-1/4 in.

144 568-C

Table 3-1. Common Work Cable Size

Common Work Cable Sizes At Main Transformer Rated Welding Current	
Cable Length	**Cable Size**
50 Feet	2 No. 3/0
100 Feet	2 No. 4/0
150 Feet	3 No. 3/0
200 Feet	3 No. 4/0

B. Parallel Module Connections



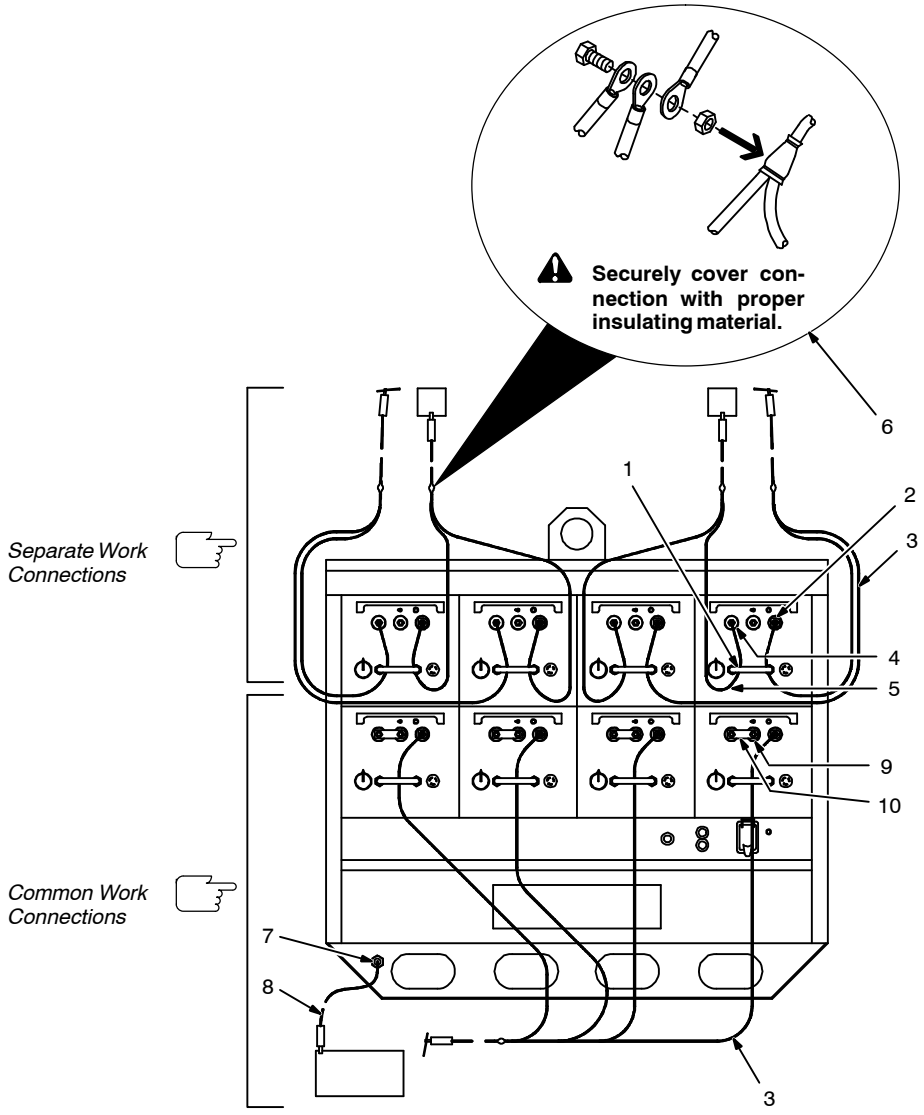
READ SAFETY BLOCKS at start of Section 4-5 before proceeding.

UNDERSIZED WELDING CABLES can cause fire.

Use single cables of adequate capacity to carry the total combined amperage of the paralleled modules (see Section 4-3) .

Securely cover common connections with proper insulating materials.

Set the Amperage Adjustment controls on all paralleled modules to provide the same output.



For common work connection, work cable must be able to carry combined weld output of all modules using the common work connection terminal (see Table 3-1 for proper cable size). When using the common work connection terminal, all connections to the common work connection terminal must be of the same polarity.

Tools Needed:

1-1/4 in.

1 Cable Restraint

Route all cables under cable restraint.

Separate Work Connections

See Section 4-3 for proper cable size.

2 Negative (–) Weld Output Terminal

3 Electrode Holder Cable

4 Positive (+) Weld Output Terminal

5 Work Cable

6 Connection Point

For Electrode Negative (Straight Polarity/DCEN), connect separate cables of same size and length from Positive (+) terminals to the work or to a suitable connection point connecting to a single work cable. Connect separate cables of same size and length from Negative (–) terminals to a suitable connection point connecting to a single electrode holder cable.

For Electrode Positive (Reverse Polarity/DCEP), reverse cable connections.

Common Work Connections

7 Common Work Connection Terminal

8 Common Work Cable

See Table 3-1 for proper size cable.

9 Frame Connection Terminal

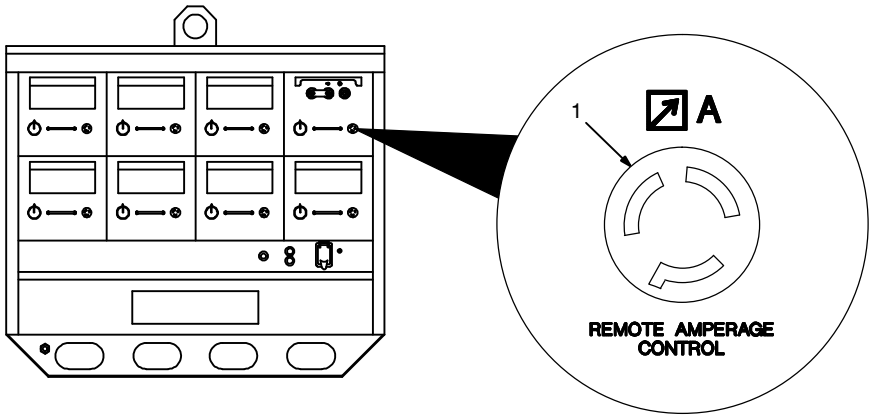
10 Jumper Link

For Electrode Negative (Straight Polarity/DCEN), connect jumper link across Positive (+) terminal and Frame Connection terminal for each paralleled module. Connect separate cables of same size and length from Negative (–) terminals to a suitable connection point connecting to a single electrode holder cable.

For Electrode Positive (Reverse Polarity/DCEP), connect jumper link across Negative (–) terminal and Frame Connection terminal for each paralleled module, and connect separate cables of same size and length from Positive (+) terminals to a suitable connection point connecting to a single electrode holder cable.

085 152-D

4-6. Remote Amperage Control Receptacle

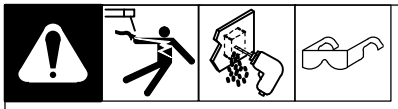


1 Remote Amperage Control Receptacles RCX1 (“X” Represents The Number Of The Applicable Module 1–8)

The twistlock receptacle in each module provides a connection point for an optional remote amperage control. To connect to one of these receptacles, insert plug from remote amperage control and turn clockwise.

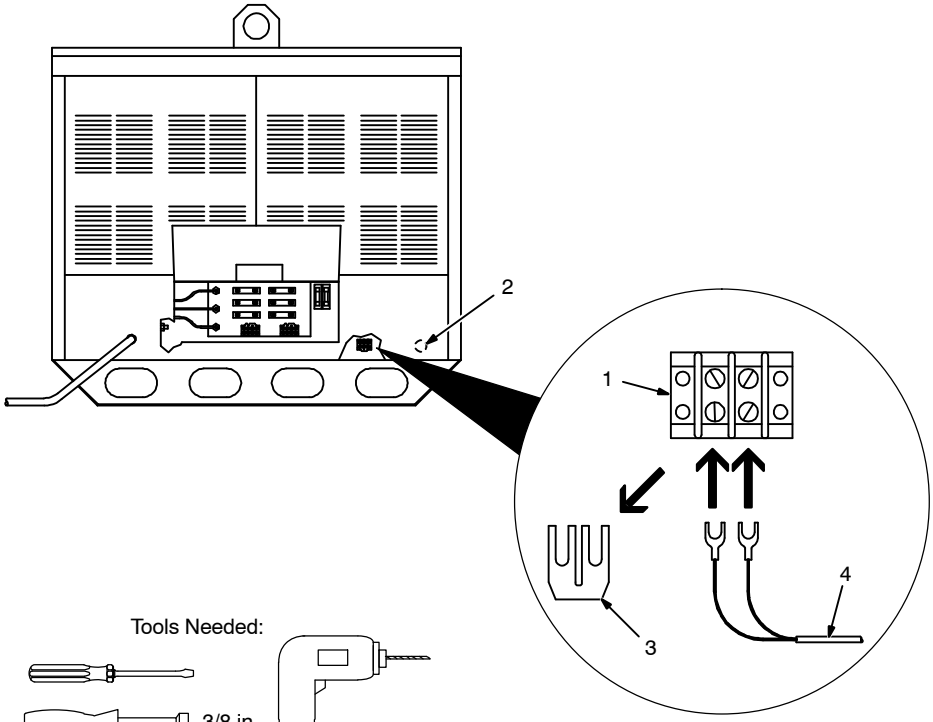
144 570-A / Ref. 174 143

4-7. Remote Contactor Control Connections (Optional)



Turn Off polyweld system, and disconnect and tagout/ lockout input power before making contactor control connections.

Whenever the Remote Contactor switch is closed with Power switch On button pressed, input power is applied to all modules.



Terminal strip 1T provides a connection point for connecting a normally open, momentary contact switch for remote contactor control.

To connect a remote contactor control, proceed as follows:

1 Terminal Strip 1T

2 Access Hole Location

Drill or punch a hole in lower right rear panel to provide access to terminal strip 1T. Hole size should accept standard strain relief connector.

Install strain relief into access hole.

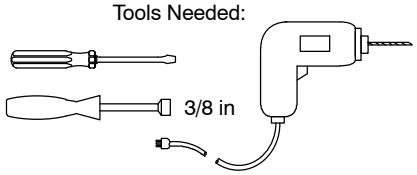
3 Jumper Link

Remove jumper link.

4 Lead Connections

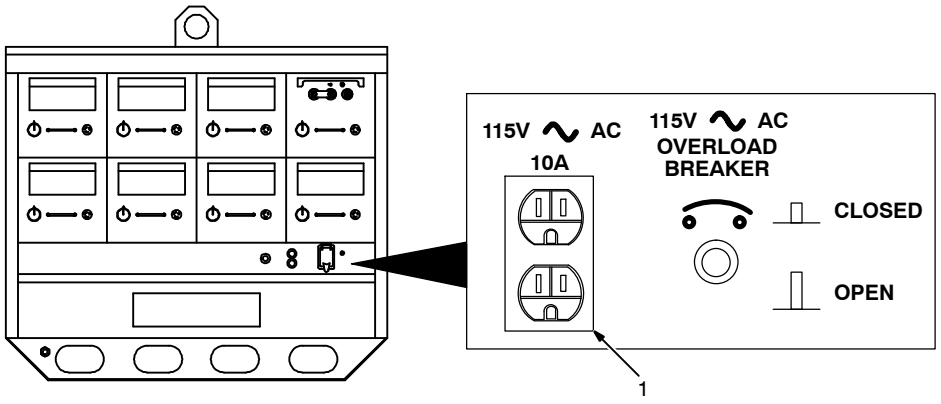
Route cord through strain relief and connect leads to 1T as shown. Polarity is not important. Connect leads on other end of cord to a suitable switch.

Close and secure rear panel access door.



Ref. 144 569-B

4-8. 115 Volts AC Duplex Receptacle



1 115 Volts AC Duplex Receptacle RC2

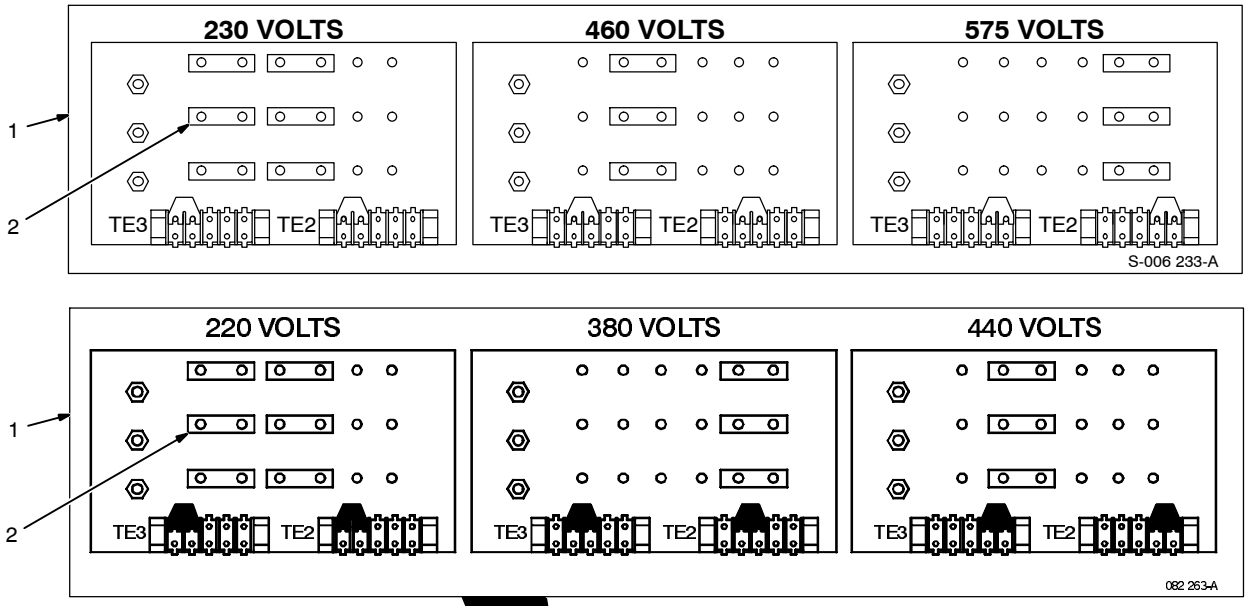
This receptacle supplies up to 10 amperes of 115 volts ac power.

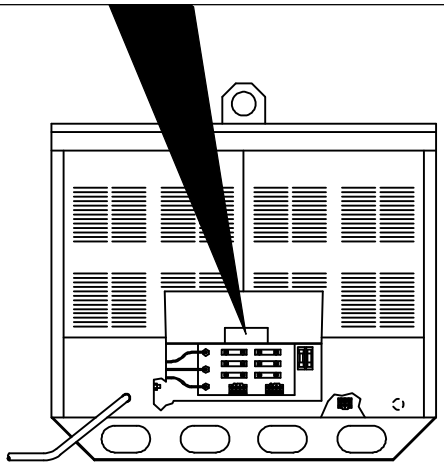
The duplex receptacle is protected from overload by supplementary protector CB1 (see Section 6-2).

Ref. 144 570-A / Ref. 085 382

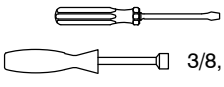
4-9. Connecting Input Power

A. Positioning Jumper Links





Tools Needed:



3/8, 1/2 in.

Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting or installing.

Jumper links allow operation on different input voltages and are factory set for the highest input voltage.

Check input voltage available at site.

Open rear panel access door to check jumper links.

1 Input Voltage Label

Look at jumper links and compare link position with unit label. Only one label will be on unit.

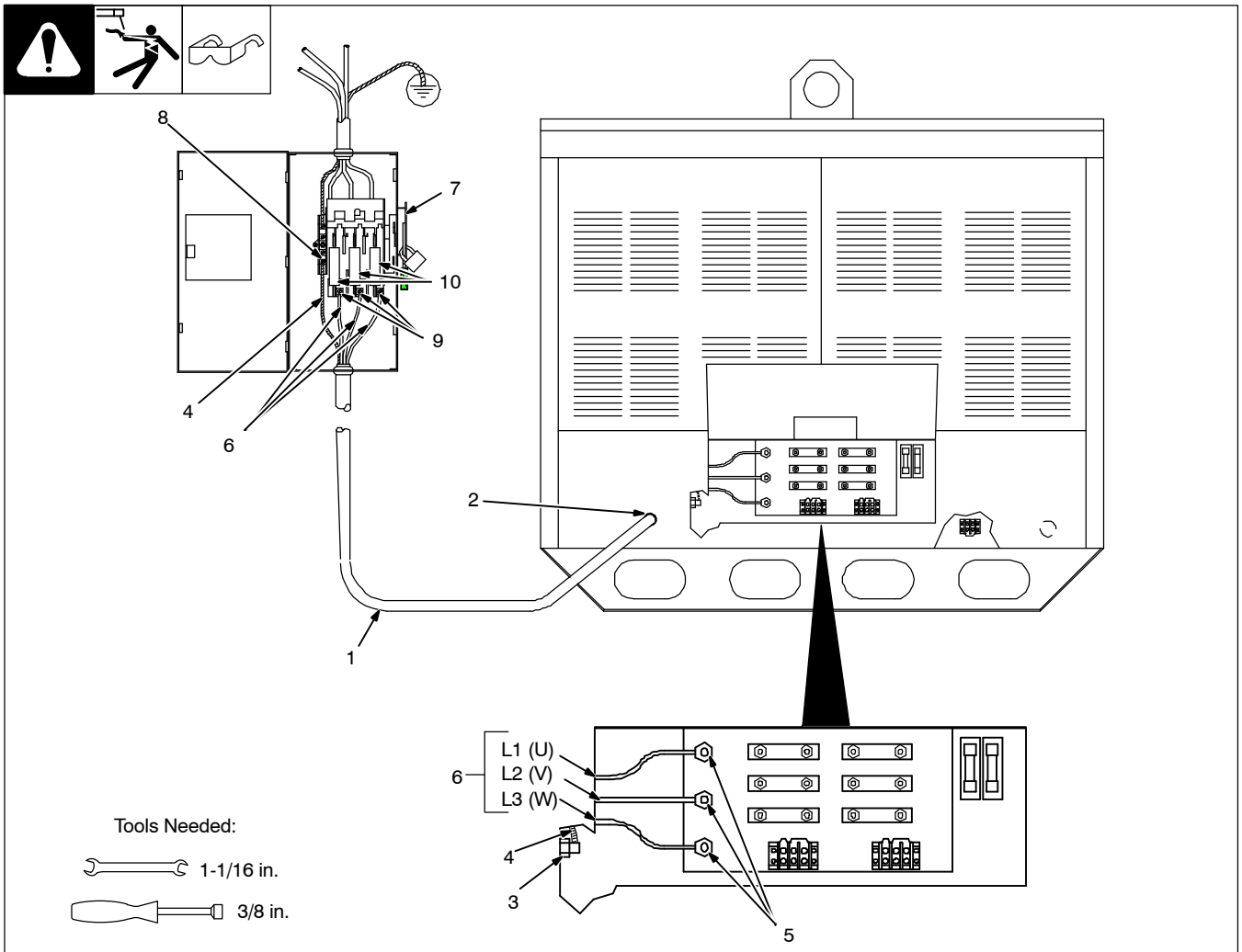
2 Input Voltage Jumper Links

Move links to match input voltage. For example, use 230 volts position when 230 volts input power is available.

Close rear panel access door or go on to Section 4-9B.

ssb5.1* 2/92 – Ref. 144 569-B

B. Connecting Input Power



ssb2.4* 1/94 – Ref. 144 569-B

Installation must meet all National and Local Codes – have only qualified persons make this installation.

Disconnect and lockout/tagout input power before connecting input conductors from unit.

Make input power connections to the welding power source first.

Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

See rating label on unit and check input voltage available at site.

1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 4-10. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

Welding Power Source Input Power Connections

2 Strain Relief (Customer Supplied)

Route conductors (cord) through strain relief and tighten screws.

3 Machine Grounding Terminal

4 Green Or Green/Yellow Grounding Conductor

Connect green or green/yellow grounding conductor to welding power source grounding terminal first.

5 Welding Power Source Line Terminals

6 Input Conductors L1 (U), L2 (V) And L3 (W)

Connect input conductors L1 (U), L2 (V) and L3 (W) to welding power source line terminals.

Close and secure access door on welding power source.

Disconnect Device Input Power Connections

7 Disconnect Device (switch shown in OFF position)

8 Disconnect Device (Supply) Grounding Terminal

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

9 Disconnect Device Line Terminals

Connect input conductors L1 (U), L2 (V) And L3 (W) to disconnect device line terminals.

10 Overcurrent Protection

Select type and size of overcurrent protection using Section 4-10 (fused disconnect switch shown).

Close and secure door on line disconnect device. Remove lockout/tagout device, and place switch in the On position.

4-10. Electrical Service Guide

Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

Input Voltage	220	230	380	440	460	575
Input Amperes At Rated Output	178	170	103	89	85	68
Max Recommended Standard Fuse Rating In Amperes [1]						
Time-Delay [2]	200	200	125	110	100	80
Normal Operating [3]	250	250	150	125	125	100
Min Input Conductor Size In AWG [4]	3/0	2/0	2	3	3	4
Max Recommended Input Conductor Length In Feet (Meters)	230 (70)	214 (65)	349 (106)	389 (118)	424 (129)	554 (169)
Min Grounding Conductor Size In AWG [4]	4	4	6	6	6	8

Reference: 2011 National Electrical Code (NEC) (including article 630)

1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.

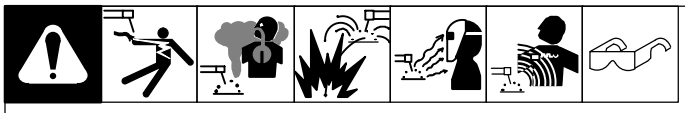
2 “Time-Delay” fuses are UL class “RK5” . See UL 248.

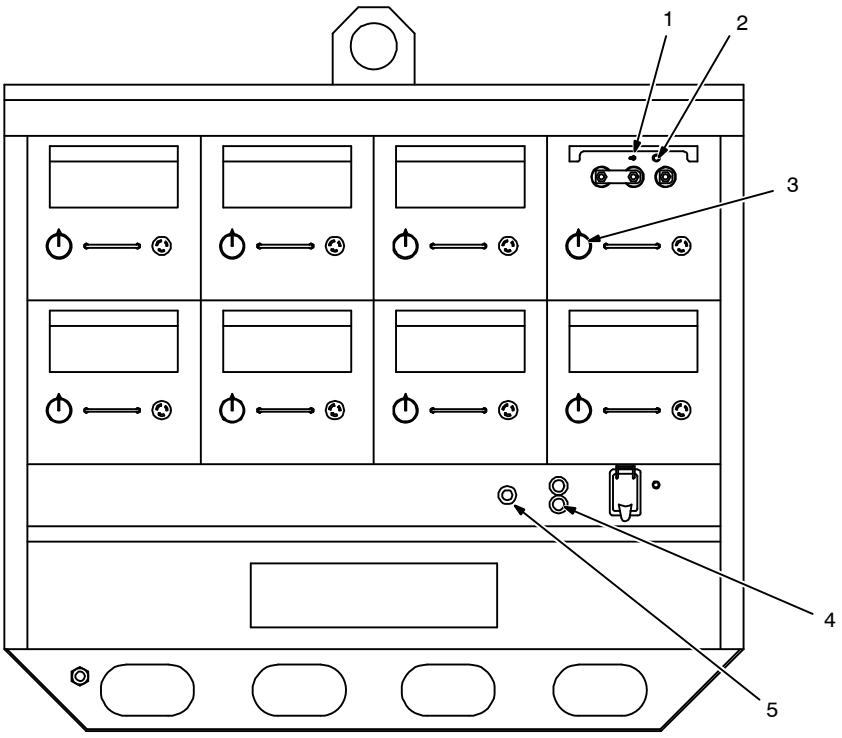
3 “Normal Operating” (general purpose - no intentional delay) fuses are UL class “K5” (up to and including 60 amps), and UL class “H” (65 amps and above).

4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.15(B)(16). If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

SECTION 5 – OPERATION

5-1. Controls



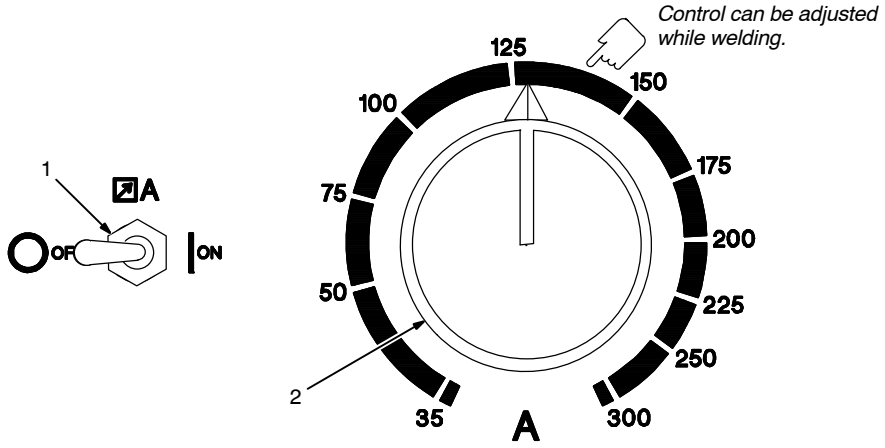


1 Remote Amperage Control Switch
2 Module Supplementary Protectors (See Section 6-2)
3 Amperage Adjustment Control
4 Power Switch
5 Pilot Light

144 570-A

5-2. Amperage Adjustment Controls

60 Hz Model Shown



1 Remote Amperage Control Switch

For front panel control of a module, place switch on that module in Off position.

For remote control, place switch in On position. See Example below.

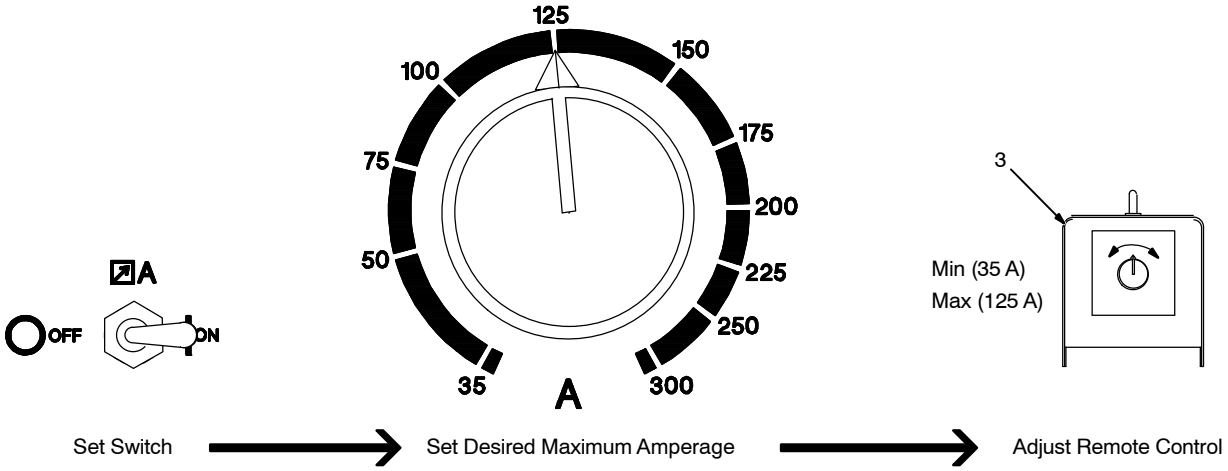
2 Amperage Adjustment Control

Use control at each module to select weld amperage for that module. The numbers are weld amperes.

3 Remote Hand Control

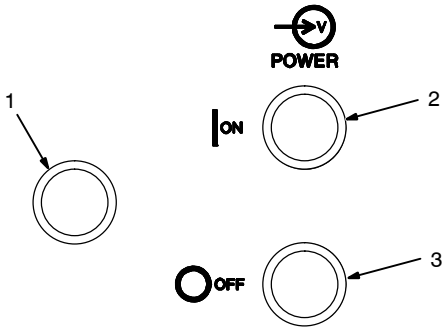
☞ *This amperage adjustment scale applies to the SMAW process only. If using this machine for the GTAW process, the scale does not apply. The actual output current while using the GTAW process is higher than the scale setting.*

Example Of Combination Remote Amperage Control



Ref. 174 143

5-3. Power Switch Push Buttons And Pilot Light



1 Pilot Light

2 Power On Push Button

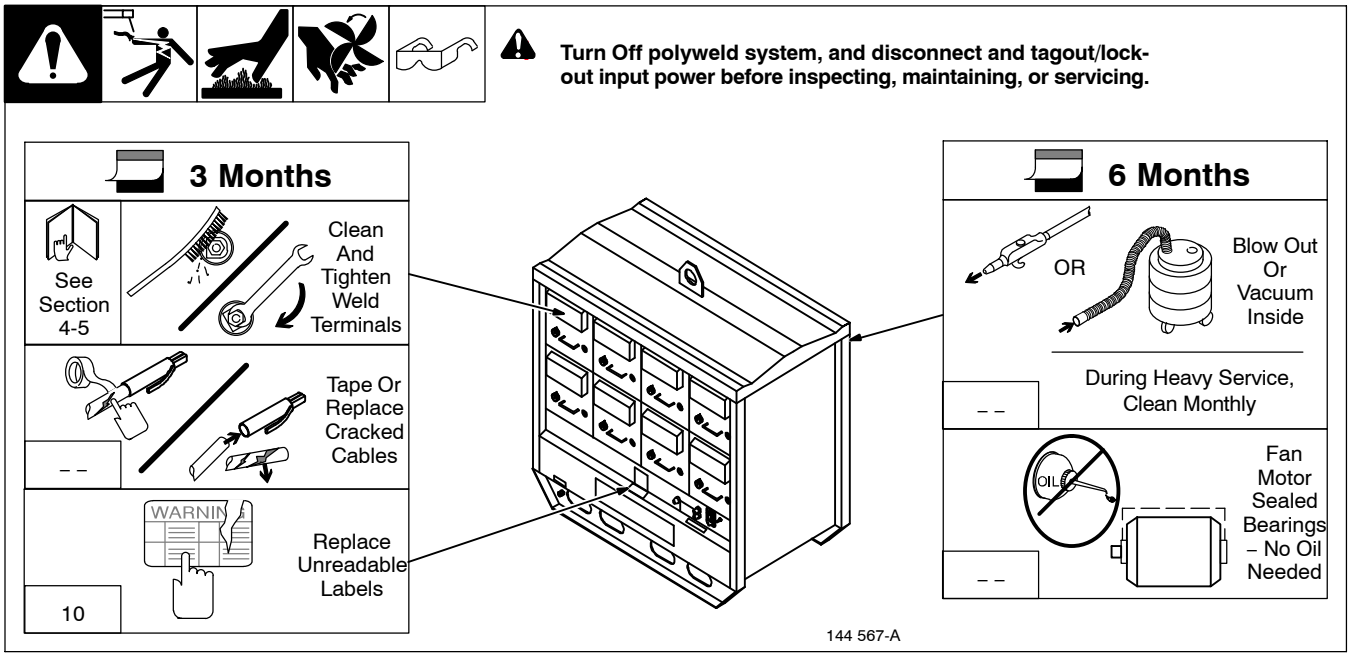
Press button to turn unit, pilot light, and fan motors On.

3 Power Off Push Button

Press button to turn unit, pilot light, and fan motors Off.

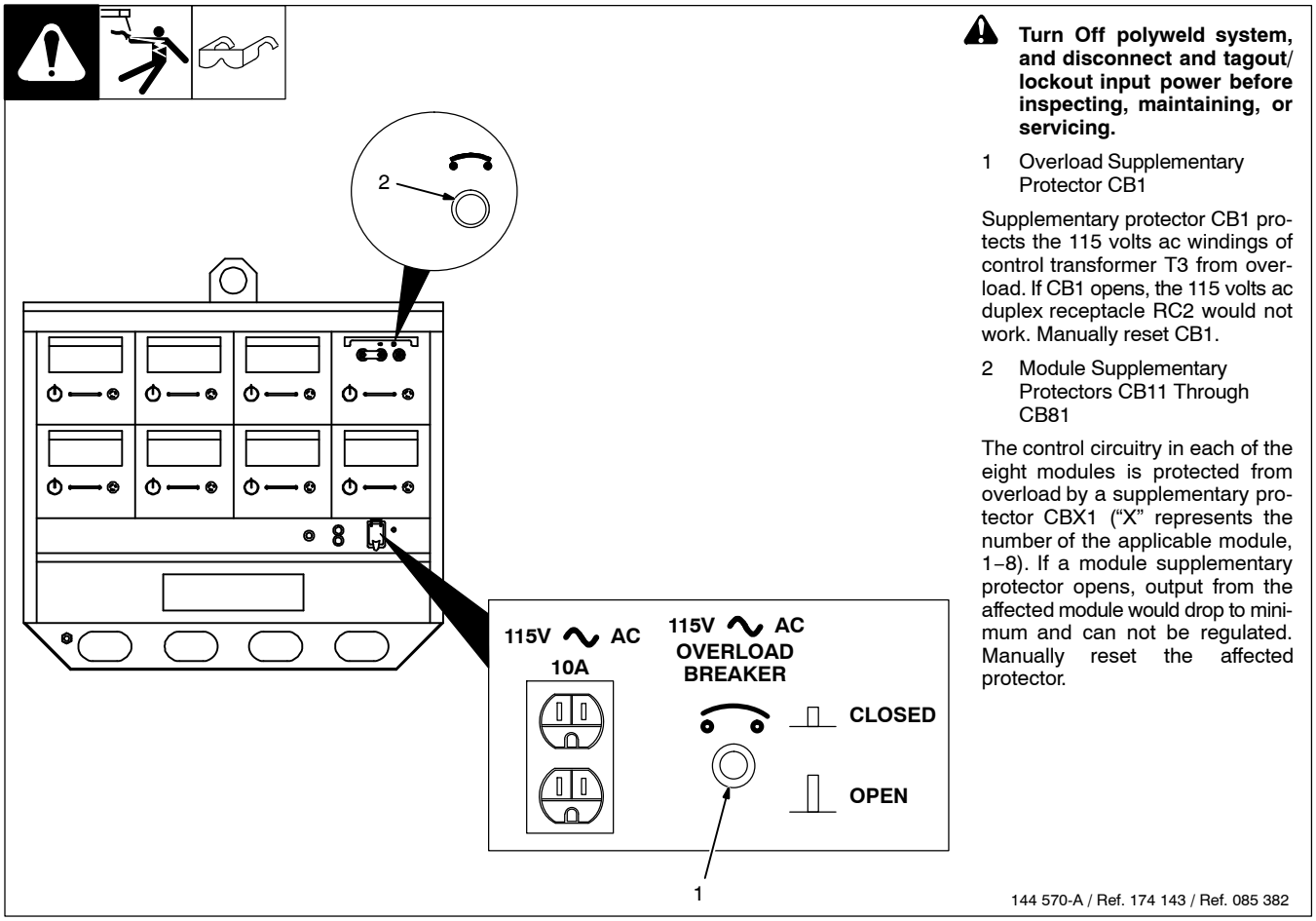
SECTION 6 – MAINTENANCE & TROUBLESHOOTING

6-1. Routine Maintenance



6-2. Overload Protection

A. Overload Supplementary Protector CB1 And Module Supplementary Protectors CB11 Through CB81



Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting, maintaining, or servicing.

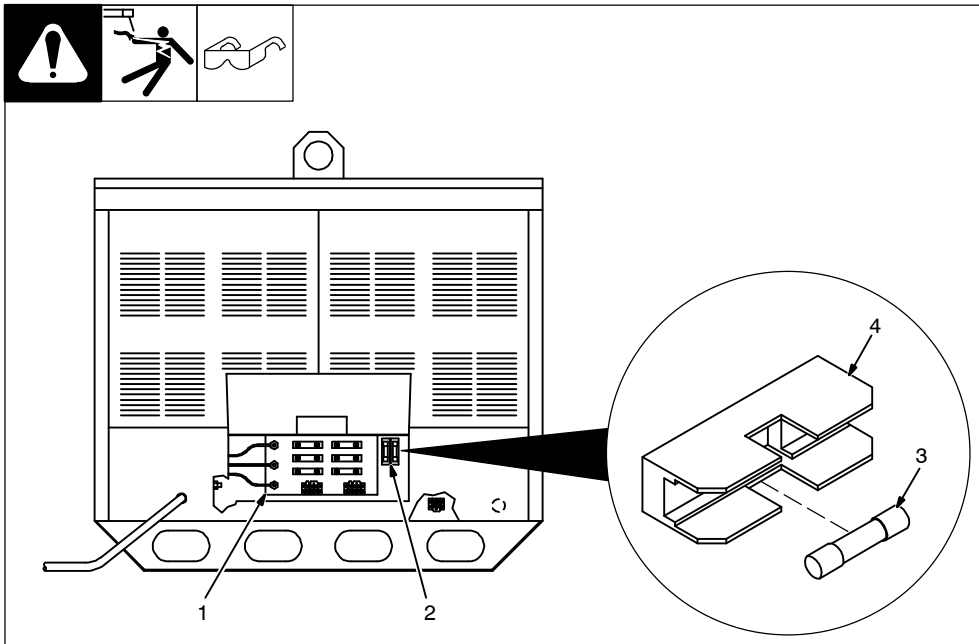
1 Overload Supplementary Protector CB1

Supplementary protector CB1 protects the 115 volts ac windings of control transformer T3 from overload. If CB1 opens, the 115 volts ac duplex receptacle RC2 would not work. Manually reset CB1.

2 Module Supplementary Protectors CB11 Through CB81

The control circuitry in each of the eight modules is protected from overload by a supplementary protector CBX1 (“X” represents the number of the applicable module, 1–8). If a module supplementary protector opens, output from the affected module would drop to minimum and can not be regulated. Manually reset the affected protector.

B. Control Fuses F3 And F4



Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting, maintaining, or servicing.

Turn Off polyweld system and disconnect input power.

1 Input Terminal Board

2 Fuses F3 And F4 Location

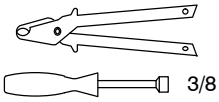
3 Fuse F3 Or F4 (See Parts List For Rating)

4 Fuse Holder

Check F3 or F4, and replace if needed. Use proper tool when removing fuse.

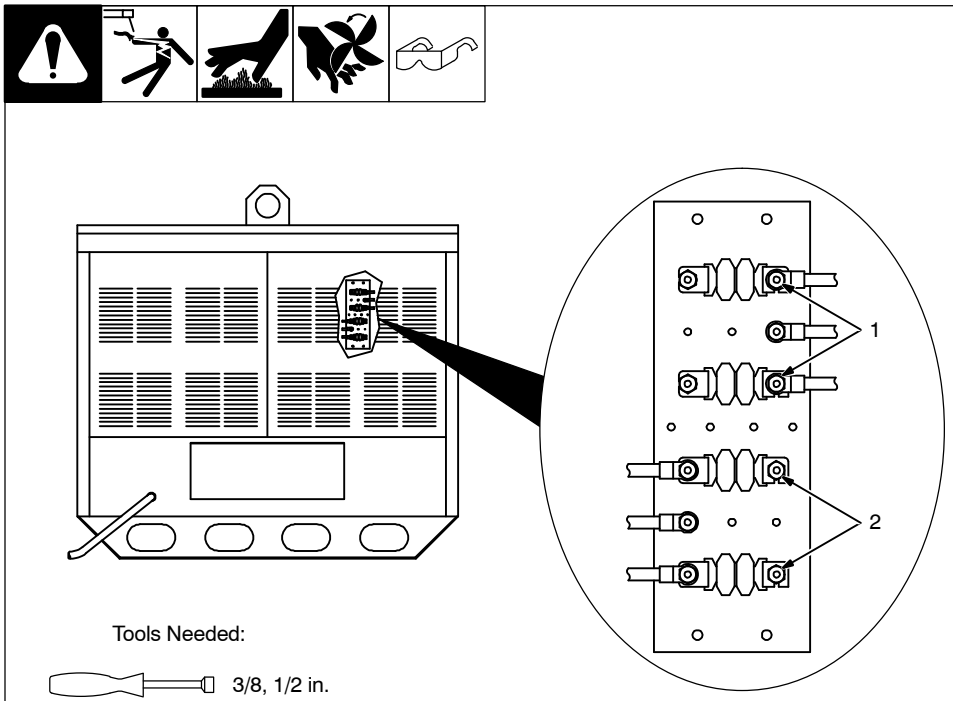
Close rear access door.

Tools Needed:

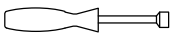


Ref. 144 569-B / Ref. 146 126-C

C. Module Fuse Links F11 And F12 Through F81 And F82



Tools Needed:



Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting, maintaining, or servicing.

Turn Off polyweld system and disconnect input power.

1 Fuse Links (Odd Number Modules)

2 Fuse Links (Even Number Modules)

Each of the eight modules is protected from overload by a pair of link-type fuses FX1 and FX2 (“X” represents the number of the applicable module, 1–8). If one fuse link for a module opens, low weld output is available at the applicable module. If both fuse links open, no weld output is available at the affected module.

To replace fuse(s), proceed as follows: Remove upper rear panel. Check fuse(s), and replace if necessary. Reinstall upper rear panel.

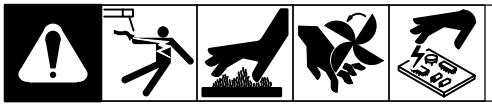
800 479 / 155 300

6-3. Blank Module Panel

Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting, maintaining, or servicing.

A blank module panel is included with each polyweld system. If a module is removed, install the blank module panel in the location where the module was removed before using the remaining modules. This panel prevents the touching of inside parts and wires, and ensures proper air flow through the polyweld system.

6-4. Troubleshooting



Turn Off polyweld system, and disconnect and tagout/lockout input power before inspecting, maintaining, or servicing.

Trouble	Remedy
No weld output from any module; fan motors off; pilot light off.	Place line disconnect device in On position (see Section 4-9).
	Check line fuse(s), and replace if needed. Reset circuit breakers (see Section 4-9).
	Check for proper input connections (see Section 4-9).
	Check position of input voltage jumper links (see Section 4-9).
	Be sure power switch is On (see Section 5-3).
	Check fuse F3 and/or F4, and replace if needed (see Section 6-2).
	Have Factory Authorized Service Station/Service Distributor check Start/Stop push buttons PB1/PB2 and replace if necessary.
No weld output from any module; fan motors on; pilot light off.	Thermostat TP1 open (overheating). Allows fans to run; thermostat closes when unit has cooled (see Section 6-2).
No weld output from any module; fan motors on; pilot light on.	Have Factory Authorized Service Station/Service Distributor check contactor W and replace if needed.
Limited output and low open circuit voltage from All modules.	Check incoming power for correct voltage. Replace line fuse if open or reset circuit breaker (see Section 4-9).
	Check position of input voltage jumper links (see Section 4-9).
No weld output from one module only.	Check fuse links, and replace if needed (see Section 6-2).
Low weld output from one module only. No amperage control.	Place Remote Amperage control switch in Off position or connect remote amperage control to Remote Amperage Control receptacle (see Section 5-2).
	Check module fuse link, and replace if needed (see Section 6-2).
	Reset module supplementary protector (see Section 6-2).
	Module thermostat open (overheating). Allow module to cool down; thermostat closes when module has cooled (see Section 6-2).
Erratic weld output.	Tighten all weld cable connections (see Section 4-5).
	Check for proper size and type of cable (see Section 4-9).
	Check for proper input and output connections (see Sections 4-9 and 4-5).
	Use dry, properly stored electrodes.
No weld output at 115 volts AC duplex receptacle.	Reset overload supplementary protector CB1 (see Section 6-2).
	Check fuse F3 and/or F4, and replace if needed (see Section 6-2).
Fan motor(s) does not run when On push button is pressed.	Check fuse F3 and/or F4, and replace if needed (see Section 6-2).
	Have Factory Authorized Service Station/Service Distributor check control relay CR1 and fan motor FM1 or FM2.
For GTAW, wandering arc – poor control of direction of arc.	Select proper size tungsten (see Section 8-1).
	Properly prepare tungsten (see Sections NO TAG or NO TAG).
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone of drafts.
	Properly prepare tungsten (see Sections NO TAG or NO TAG).

Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Replace torch parts if water has leaked into torch.
For GTAW, output current does not match the Amperage Adjustment control setting.	The amperage adjustment scale applies to the SMAW process only. The scale does not apply while using the GTAW process with this machine. Actual output current is higher while using the GTAW process.

Notes

SECTION 7 – ELECTRICAL DIAGRAM

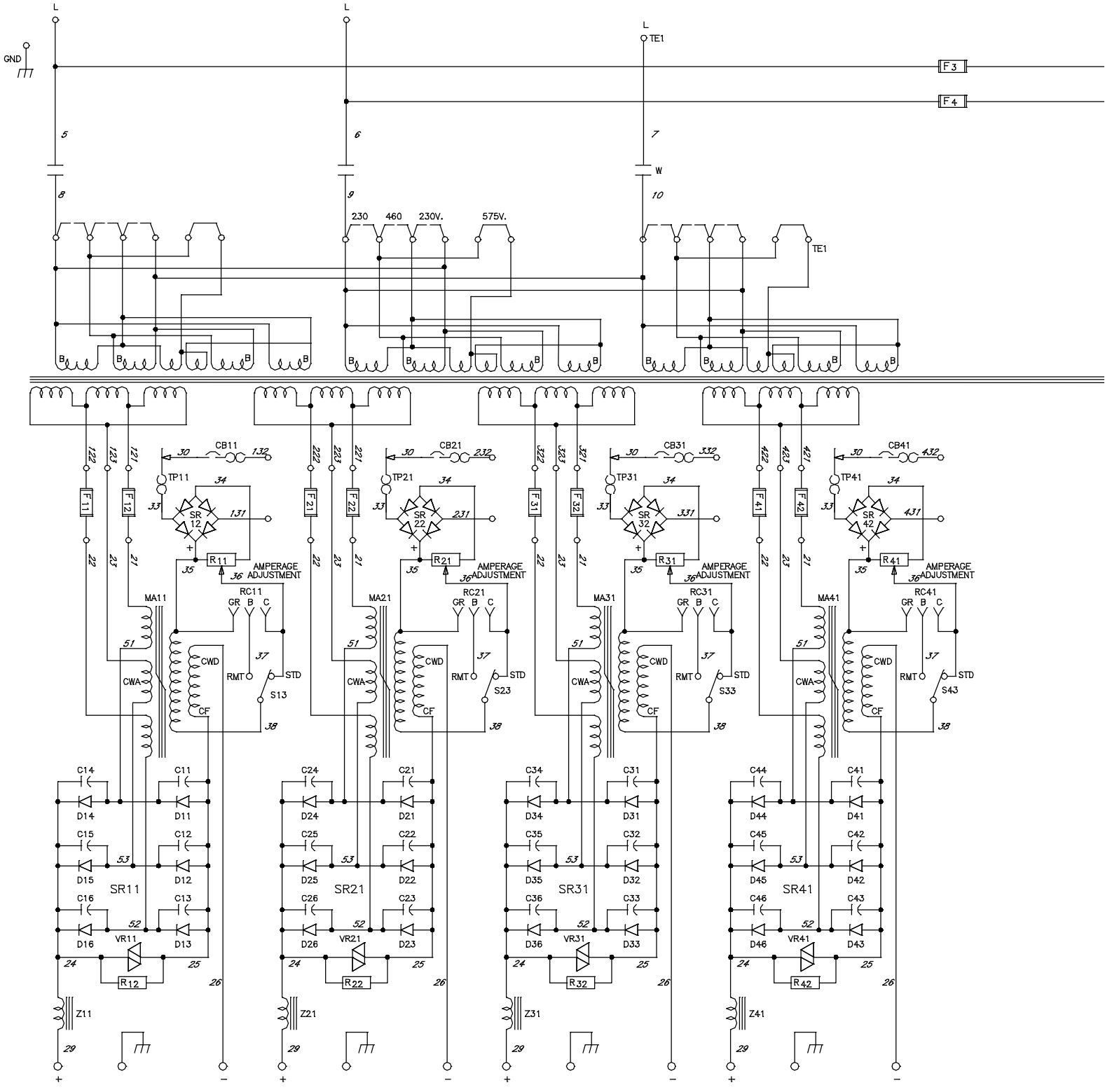
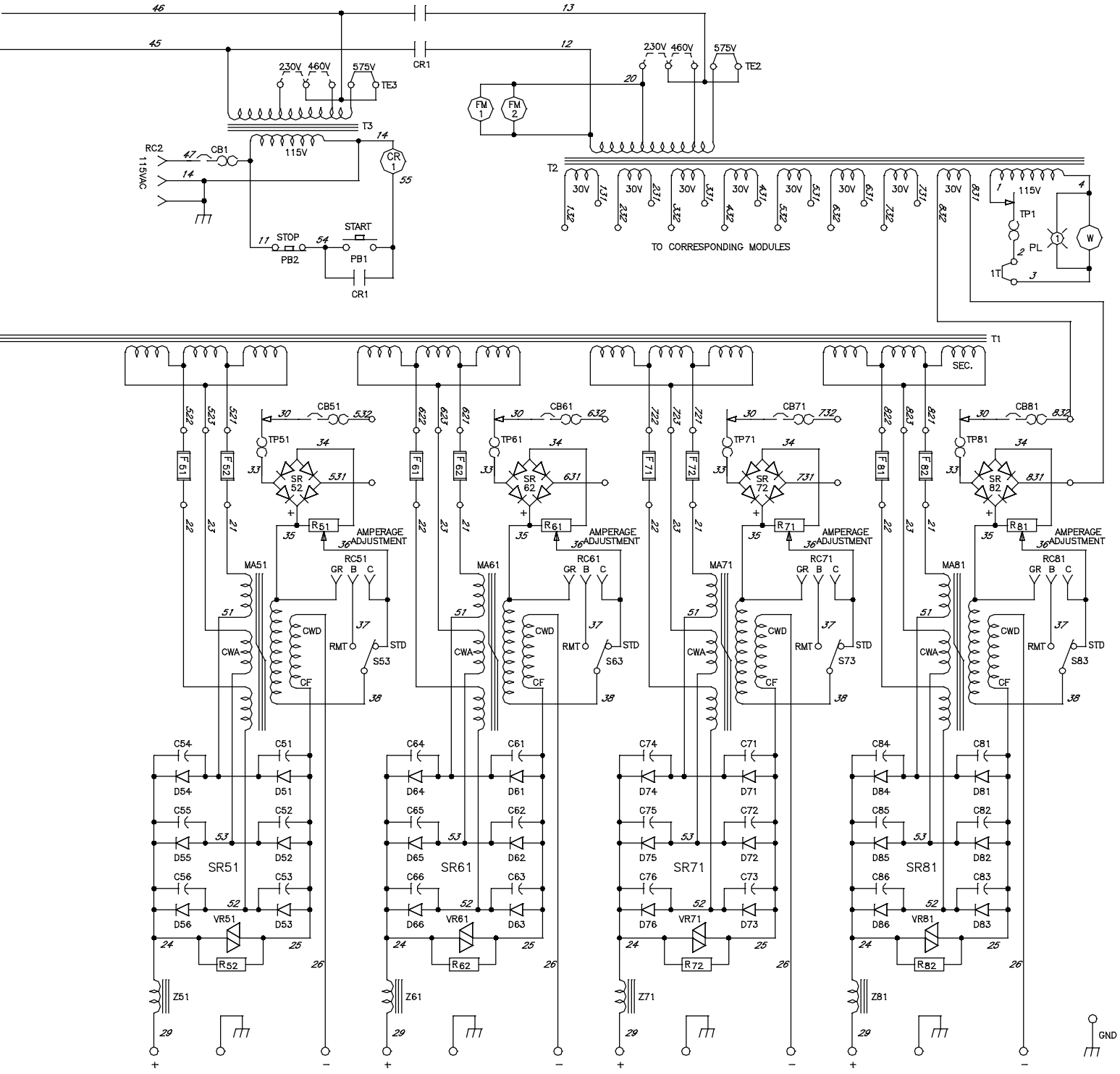


Figure 7-1. Circuit Diagram For Polyweld System


46
45
13
12
CR1
230V 460V 575V
TE3
T3
115V
RC2
115VAC
47
CB1
14
CR 1
55
11
STOP
PB2
54
START
PB1
CR1
230V 460V 575V
TE2
20
FM 1
FM 2
T2
30V
TO CORRESPONDING MODULES
1
115V
4
TP1
2
PL
W
1T
3
T1
SEC.
CB51
CB61
CB71
CB81
TP51
TP61
TP71
TP81
SR 52
SR 62
SR 72
SR 82
F51
F52
F61
F62
F71
F72
F81
F82
R51
R61
R71
R81
AMPERAGE ADJUSTMENT
MA51
MA61
MA71
MA81
RC51
RC61
RC71
RC81
GR B C
CWD
CWA
CF
RMT
STD
S53
S63
S73
S83
SR51
SR61
SR71
SR81
VR51
VR61
VR71
VR81
R52
R62
R72
R82
Z51
Z61
Z71
Z81
GND

SD-082 527-C

SECTION 8 – SELECTING AND PREPARING A TUNGSTEN FOR DC OR AC WELDING

Whenever possible and practical, use DC weld output instead of AC weld output.

8-1. Selecting Tungsten Electrode (Wear Clean Gloves To Prevent Contamination Of Tungsten)

☞ *Not all tungsten electrode manufacturers use the same colors to identify tungsten type. Contact the tungsten electrode manufacturer or reference the product packaging to identify the tungsten you are using.*

Electrode Diameter	Amperage Range - Gas Type♦ - Polarity	
	(DCEN) – Argon Direct Current Electrode Negative (For Use With Mild Or Stainless Steel)	AC – Argon Balance Control @ 65% Electrode Negative (For Use With Aluminum)
2% Ceria, 1.5% Lanthanum, Or 2% Thorium Alloy Tungstens		
.040" (1 mm)	25-85	20-80
1/16" (1.6 mm)	50-160	50-150
3/32" (2.4 mm)	130-250	135-235
1/8" (3.2 mm)	250-400	225-360
Pure Tungsten		
.040" (1 mm)	Pure Tungsten Not Recommended For DCEN – Argon	10-60
1/16" (1.6 mm)		50-100
3/32" (2.4 mm)		100-160
1/8" (3.2 mm)		150-210

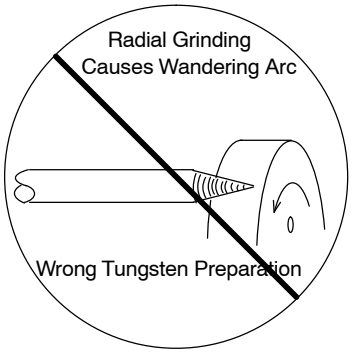
♦Typical argon shielding gas flow rates are 11 to 35 cfh (cubic feet per hour).

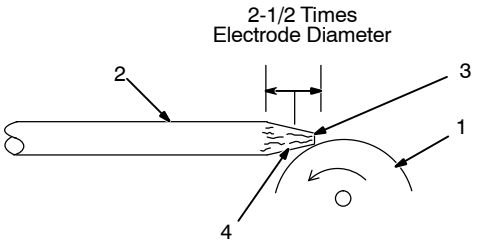
Figures listed are a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

8-2. Preparing Tungsten Electrode For Welding With Phase Control Machines

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

A. Preparing Tungsten For DC Electrode Negative (DCEN) Welding





Ideal Tungsten Preparation – Stable Arc

1 Grinding Wheel

Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.

2 Tungsten Electrode

A 2% ceriated tungsten is recommended.

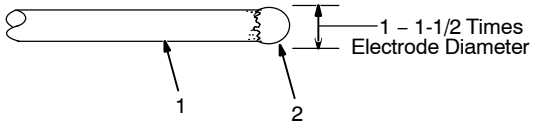
3 Flat

Diameter of this flat determines amperage capacity.

4 Straight Ground

Grind lengthwise, **not radial**.

B. Preparing Tungsten For AC Welding



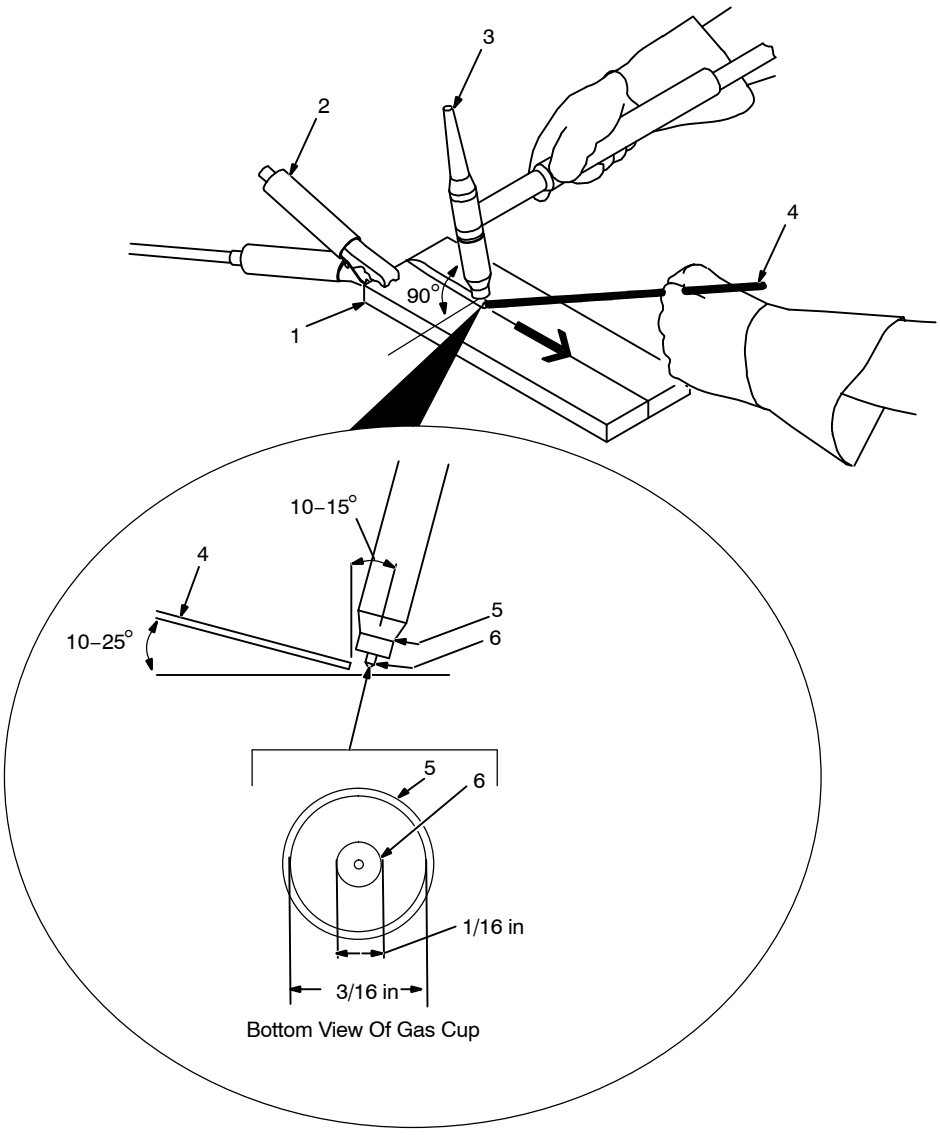
1 Tungsten Electrode

A pure tungsten is recommended..

2 Balled End

Ball end of tungsten by applying AC amperage recommended for a given electrode diameter (see Section 8-1). Let ball on end of the tungsten take its own shape.

9-1. Positioning The Torch



Bottom View Of Gas Cup

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using cerium or lanthanum based tungsten instead of thoriated. Thorium dust contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

Place as close to the weld as possible.

3 Torch

4 Filler Rod (If Applicable)

5 Gas Cup

6 Tungsten Electrode

Select and prepare tungsten according to Section 8.

Guidelines:

The inside diameter of the gas cup should be at least three times the tungsten diameter to provide adequate shielding gas coverage. (For example, if tungsten is 1/16 in diameter, gas cup should be a minimum of 3/16 in diameter.

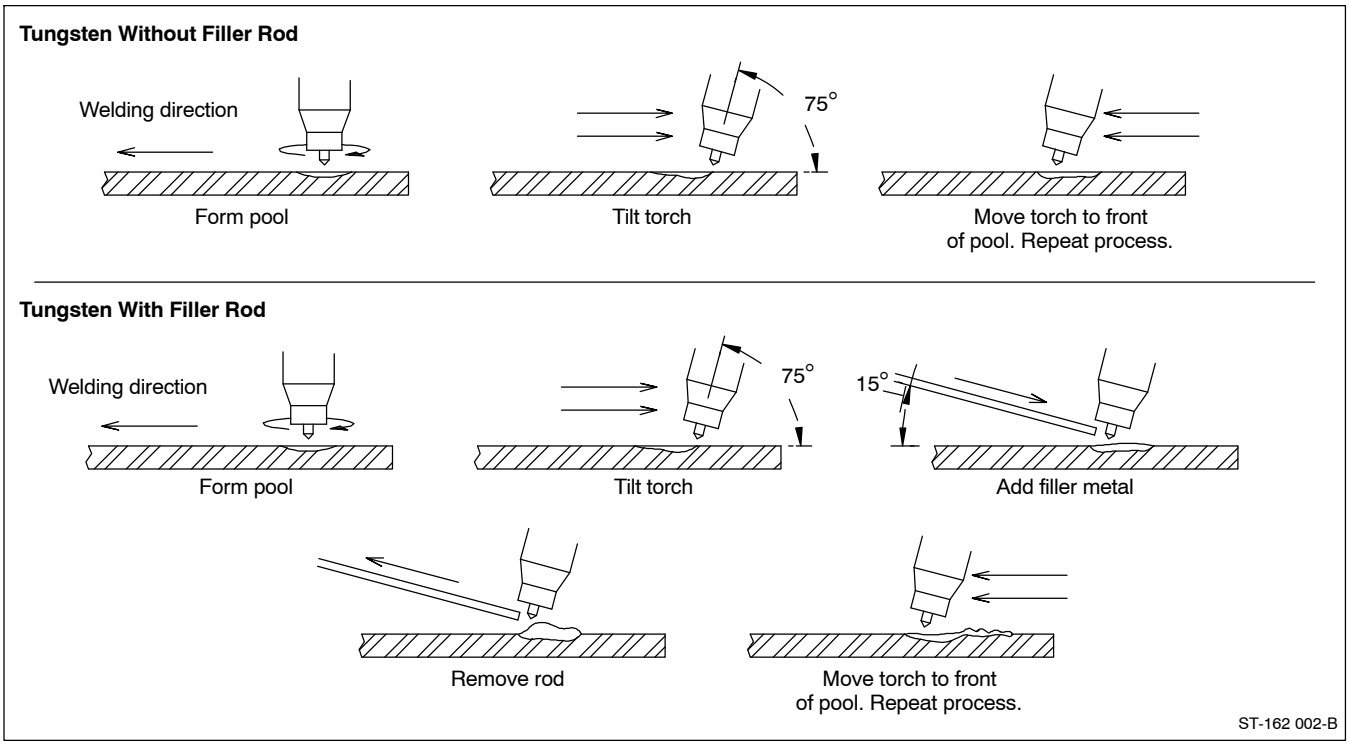
Tungsten extension is the distance the tungsten extends out gas cup of torch.

The tungsten extension should be no greater than the inside diameter of the gas cup.

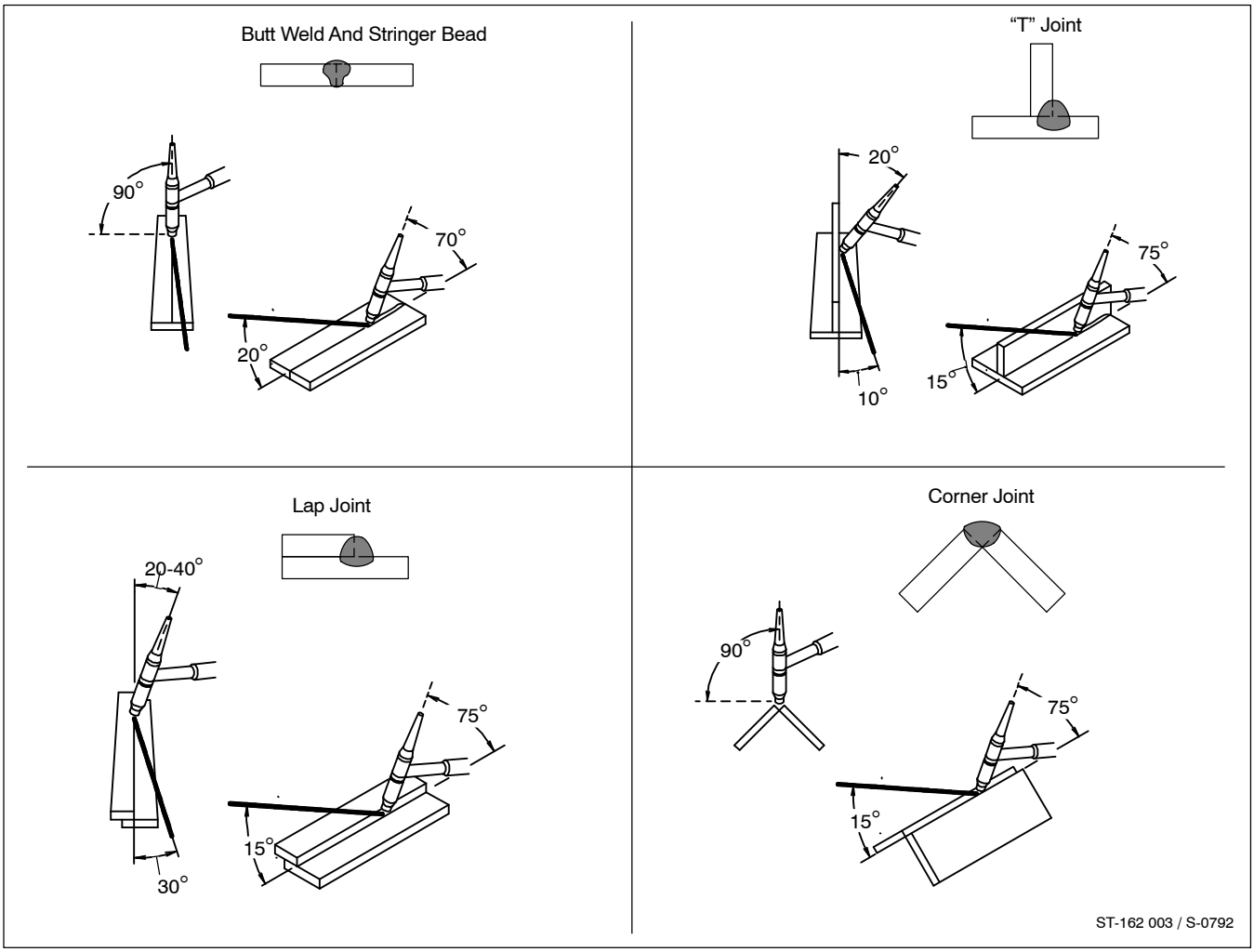
Arc length is the distance from the tungsten to the workpiece.

Ref. ST-161 892

9-2. Torch Movement During Welding



9-3. Positioning Torch Tungsten For Various Weld Joints



Notes

☞ *Hardware is common and not available unless listed.*

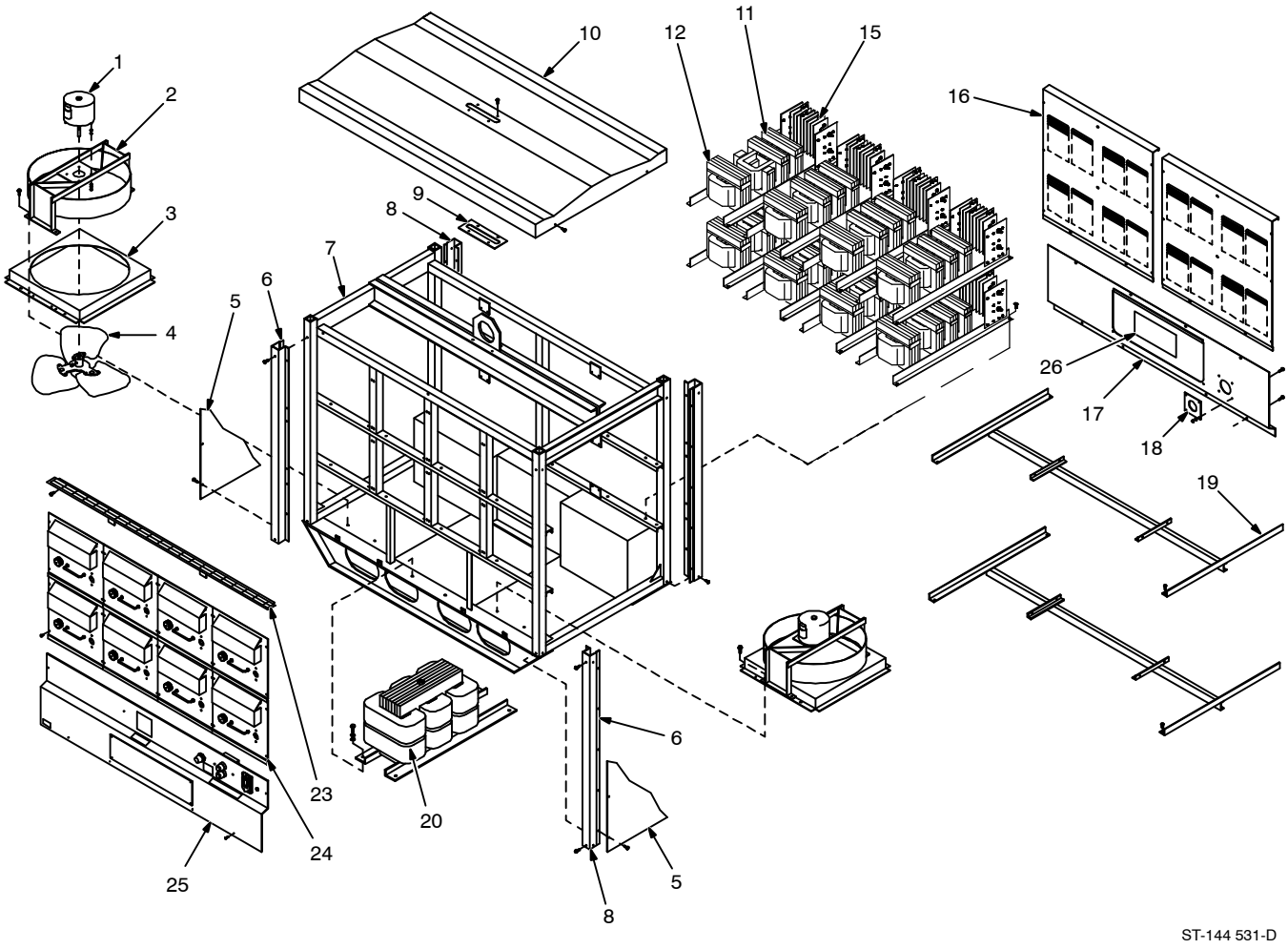


Figure 10-1. Main Assembly (Section A)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-1. Main Assembly (Section A)

1	FM1,2	032 605	Motor, Cap Perm SP 1/4 HP 230VAC 1625RPM	2
2		071 763	Frame, Mtg Fan Motor	2
3		014 544	Chamber, Plenum	2
4		147 558	Blade, Fan 20 In 3wg 21deg .500 Bore CCW	2
5		087 125	Panel, Side	2
6		086 677	Column, Corner LH Front And RH Rear	2
7		144 583	Base	1
8		086 678	Column, Corner RH Front And LH Rear	2
9		032 473	Gasket, Lift Eye	1
10		032 474	Cover, Top	1
11	MA,Z	253 813	Amplifier & Stabilizer, Mag (Includes)	8
12		084 932	Stabilizer, (Includes)	1
	TP11	200 936	Thermostat, NC	1
15	SR11	210 352	Rectifier Assembly, SI Diode	1
16		086 679	Panel, Rear Upper	2
17		+087 178	Panel, Rear Lower	1
18		102 207	Plate, Adapter Power Cord	1
19		087 124	Frame, Mtg Module Center	2
		020 279	Clamp, Stl Cush .750Dia x .281Mtg Hole	6
		087 318	Clamp, Stl Cush 1.000Dia x .203Mtg Hole	6
20	T1	128 492	Transformer, Pwr Main (230/460/575) (Includes)	1
	TP1	026 181	Thermostat, NC	1
20	T1	128 493	Transformer, Pwr Main (220/380/440) (Includes)	1
	TP1	026 181	Thermostat, NC	1
23		173 513	Screen, Front Upper	1
24		Fig10-3	Panel, Front Module W/Components	8
25		Fig 10-1	Panel, Front Lower W/Components	1
		603 732	Nut, Brs Hex .750-10 Full Hvy	2
26		217 733	Label, Warning Electric Shock & Input Power (EN/FR)	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

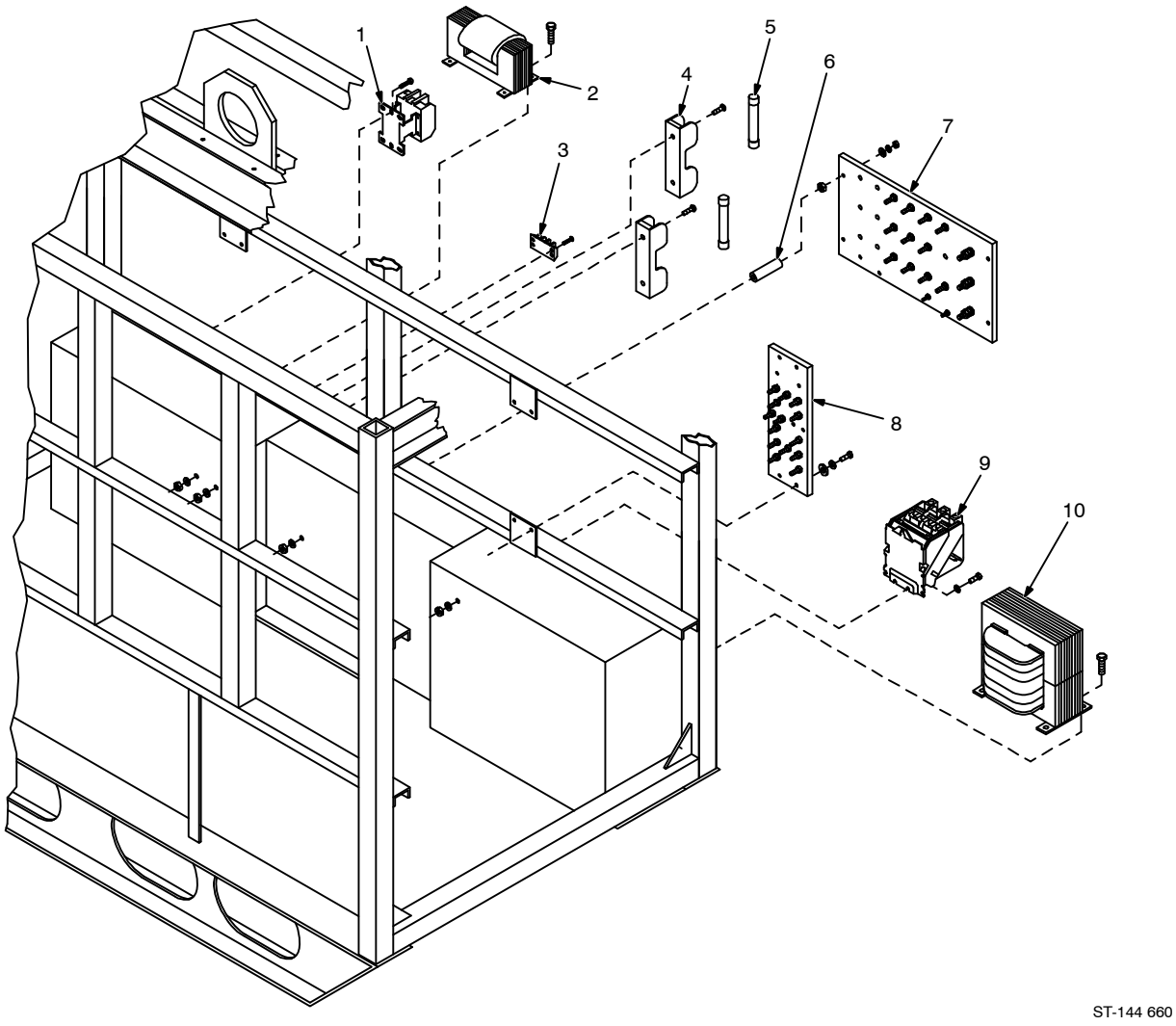


Figure 10-2. Main Assembly (Section B)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-2. Main Assembly (Section B)

1	CR1	194 307	Contactor, Def Prp 40A 3P 120V	1
2	T3	092 324	Transformer, kVA 1 115-230/460/575	1
2	T3	092 322	Transformer, kVA 1 115-220/380/440 (50 Hz)	1
3	1T	038 617	Block, Term 30A 2P	1
		038 620	Link, Jumper Term Blk 30A	1
4		070 404	Holder, Fuse Crtg 30A 600V 1P w/clips	2
5	F3,4	*012 664	Fuse, Crtg 15A 600V	2
6		010 117	Tubing, Stl .625 OD x .156 Wall x 2.625 Lg	4
7	TE1	027 096	Terminal Assembly, Pri 3PH Dual Voltage (See Fig 10-6)	1
8	F11-82	249 866	Fuse Panel, Module (See Fig 10-5)	4
		177 711	Insulator, Cover Fuse	4
9	W	099 044	Contactor, Sz 3-1/2 3P 110-120/220-240 (Includes)	1
		048 599	Coil, Cntor 115/230V Sz 3-1/2	1
10	T2	144 589	Transformer, kVA 2 115-230/460/575	1
10	T2	144 590	Transformer, kVA 2 115-220/230/380/440 (50 Hz)	1
		015 722	Grommet, Rbr 1.250 ID x 1.500Mtg Hole	2

*Recommended Spare Parts.

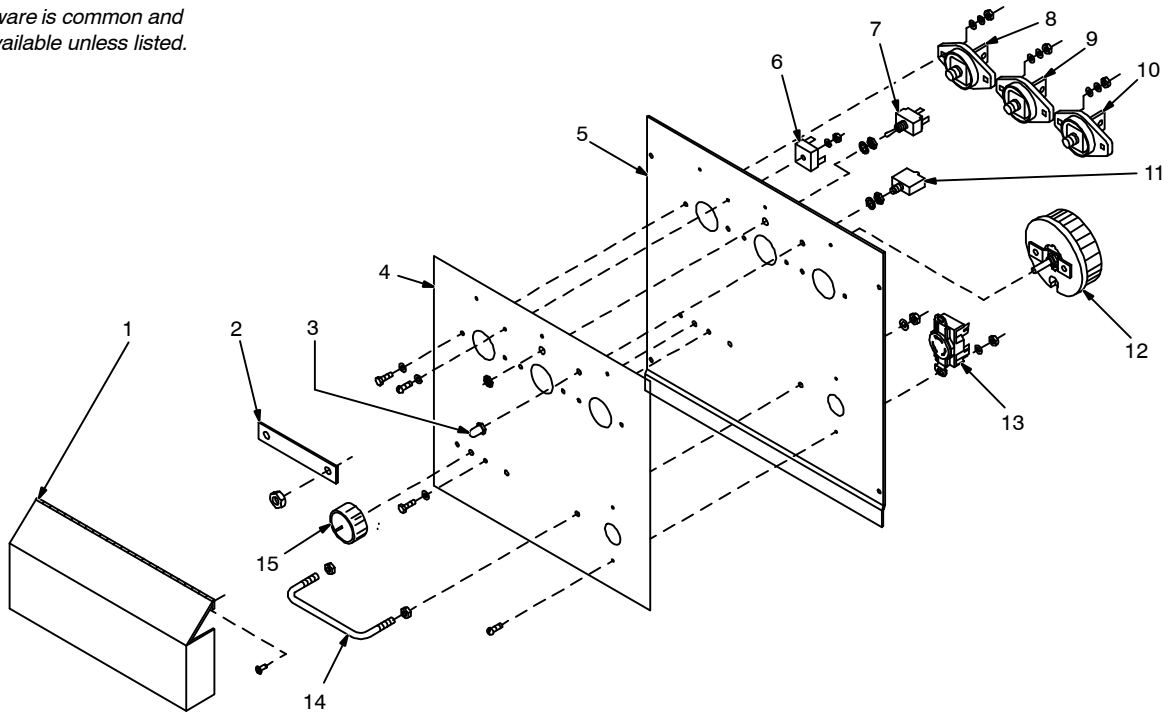
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-3. Panel, Front Module w/Components (Fig 10-1 Item 24)

1		034 253	Door, Access Pwr Output (Includes)	1
		032 477	Insulator, Cover Secondary	1
2		038 978	Link, Jumper	1
3		026 758	Boot, Circuit Breaker	1
4		177 618	Plate, Front Module 50/60 HZ Models	1
4		174 143	Plate, Front Module 60 HZ Models	1
5		098 899	Panel, Front Module	1
6	SR12	035 704	Rectifier, Integ 40A 800V	1
7	S13	*011 609	Switch, Tgl SPDT 156A 125VAC	1
8		181 245	Terminal, Pwr Output Red	1
9		182 665	Terminal, Pwr Output Neutral	1
10		181 246	Terminal, Pwr Output Black	1
11	CB11	083 432	Supplementary Protector, Man Reset 1P 10A 250V	1
12	R11	222 736	Rheostat, WW 150W 15 ohm	1
13	RC11	039 607	Receptacle, Twlk 3P3W 20A 250V	1
		605 797	Plug, Twlk 3P3W 20A 120V Arrow Hart 6312	
14		010 828	Handle	1
15		097 926	Knob, Pointer	1

☞ *Hardware is common and not available unless listed.*



ST-155 304-C

Figure 10-3. Panel, Front Module w/Components

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-4. Panel, Front Lower w/Components (Fig 10-1 Item 25)

1		+086 855	Panel, Front Lower	1
2		217 136	Label, Warning Electric Shock	1
3		174 847	Label, General Precautionary	1
5		204 360	Light, Ind White Lens (Includes)	1
6	PL1	*027 633	Bulb, Incand Bayonet Base 8V	1
7		204 361	Lens, Light Ind White	1
8	Start	247 925	Push Button, Operator Black	1
9	Start	247 929	Contact Block, NO PB	1
10	Stop	247 931	Contact Block, NC PB	1
11	Stop	247 928	Push Button, Operator Red	1
12		016 585	Cover, Dust	1
13	RC2	604 176	Receptacle, Str DX Grd 2P3W 15A 125V	1
		073 690	Plug, Str Grd Armd 2P3W 15A 125V P & S 5266DF	
14	CB1	083 432	Supplementary Protector, Man Reset 1P 10A 250V	1
15		026 758	Boot, Circuit Breaker	1
16		245 321	Cover, Rcpt Weatherproof Duplex	1
19			Nameplate, (Order By Model And Serial Number)	1
20		085 382	Label, Component Location	1

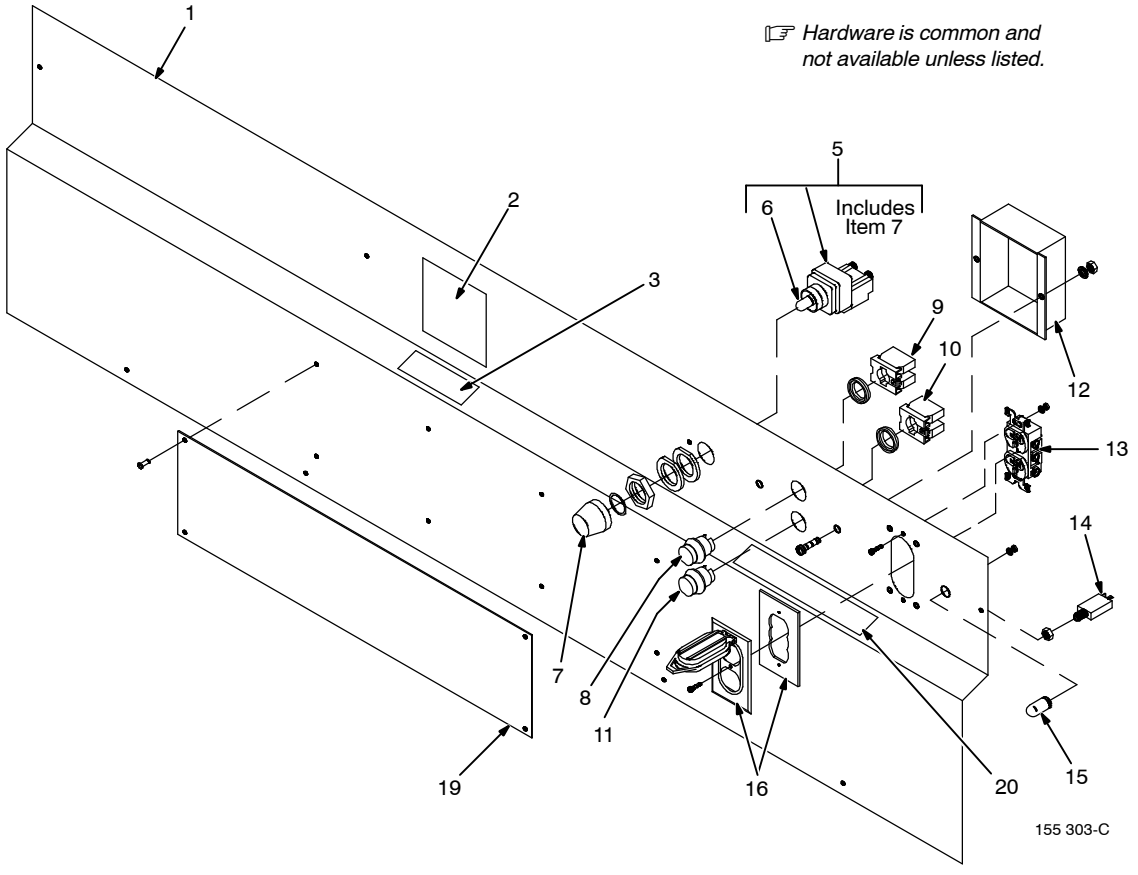
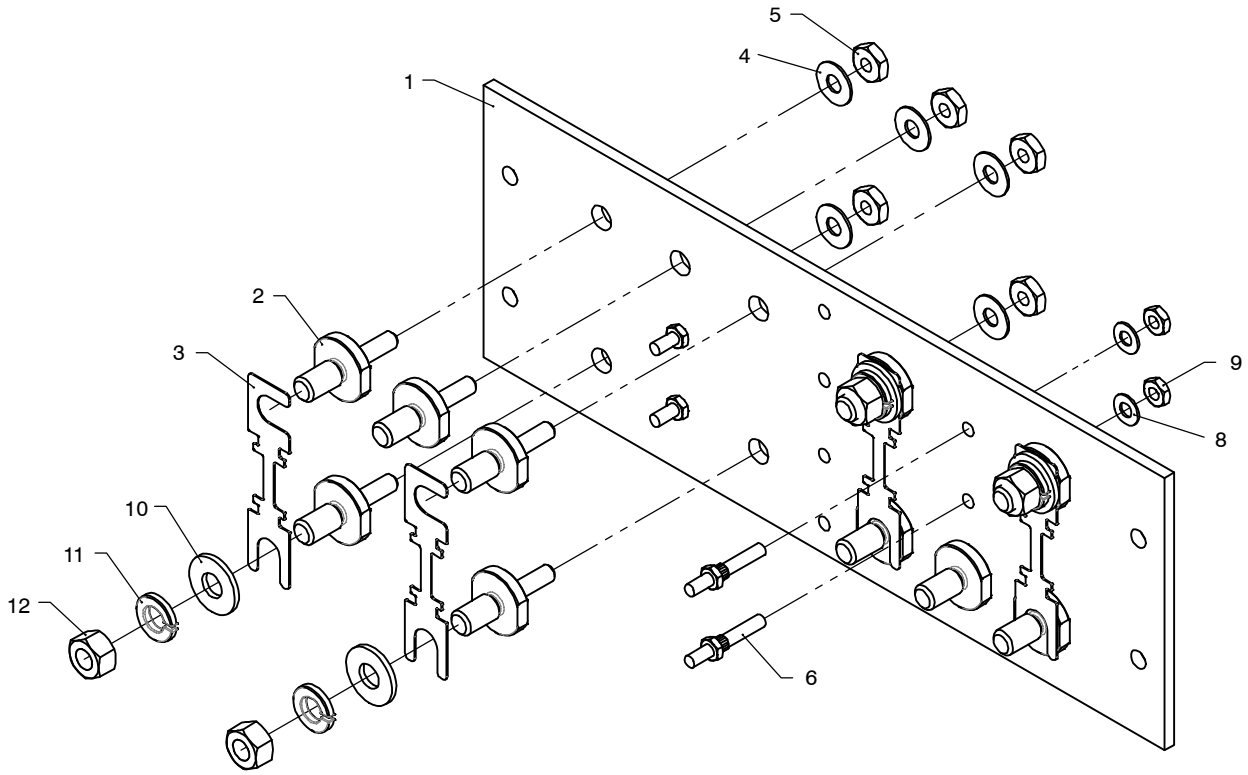


Figure 10-4. Panel, Front Lower w/Components

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



249 866-A

Figure 10-5. Fuse Panel, Module

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 10-5. Fuse Panel, Module (Figure 10-2 Item 8)				249 866
1		249 868	Panel, Fuse AC Secondary	1
2		249 870	Stud, Terminal Board Fuse Links	10
3		249 867	Fuse, Link 200 Amp 80 Volt	4
4		010 915	Washer, Flat .257ID X 0.640OD X .031T Brs	10
5		*601 836	Nut, 250-20 .50HEX .19H Brs	10
6		038 887	Stud, Primary Board Brs 10-32 X 1.375	4
8		010 913	Washer, Flat .218ID X 0.460OD X .031T Brs	4
9		601 835	Nut, 010-32 .38 Hex .13H Brs	4
10		602 242	Washer, Flat .375ID X 0.875OD X .083T Stl Pld Blk	4
11		602 213	Washer, Lock .380ID X 0.691OD X .115T Stl Pld Split .375	4
12		601872	Nut, 375-16 .56Hex .34H Stl Pld Blk	4

*Recommended Spare Parts.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

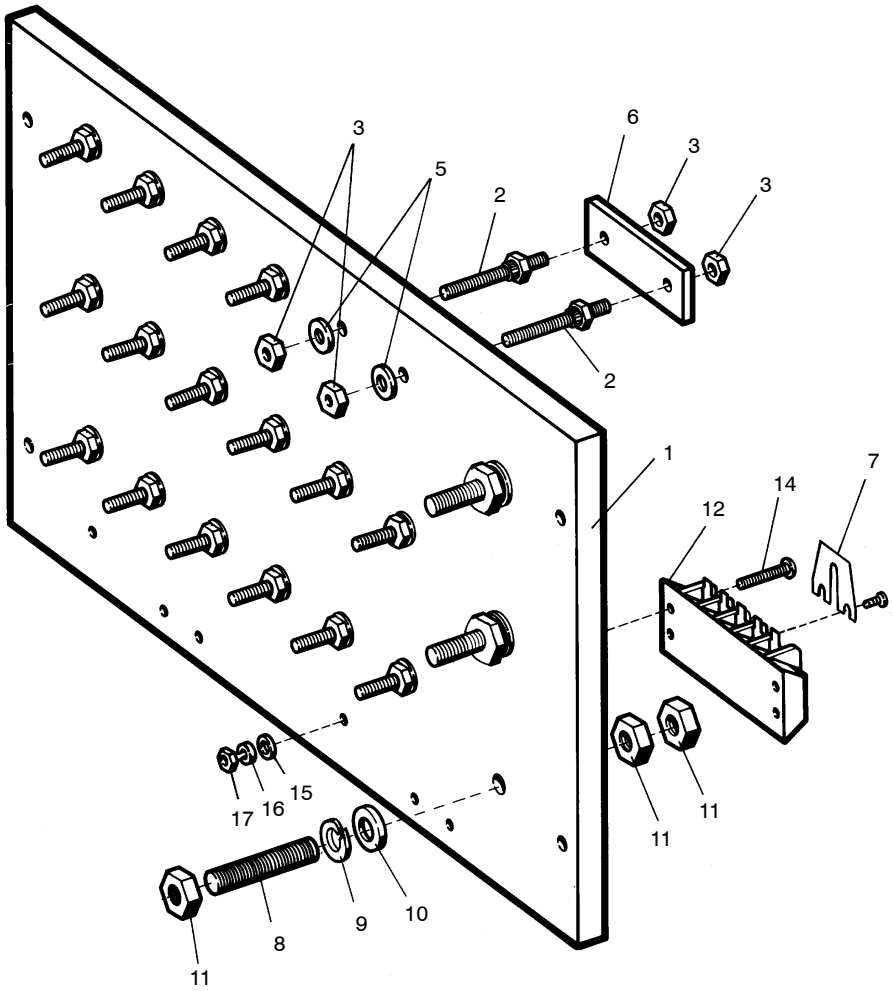


Figure 10-6. Terminal Assembly, Pri 3ph

Item No.	Part No.	Description	Quantity
		Figure 10-6. Terminal Assembly, Pri 3ph (Figure 10-2 Item 7)	027 096
1	038 974	Terminal Board, pri	1
2	038 890	Stud, Pri Bd Brs .250-20 x 2.125	18
3	601 836	Nut, Brs Hex .250-20 Jam Hvy	30
5	010 915	Washer, Flat Brs .250 ID x .625 OD x .031Thk	18
6	038 994	Link, Jumper Pri	6
7	038 620	Link, Jumper Term Blk 30A	2
8	038 804	Stud, Brs .375-16 x 2.500	3
9	602 213	Washer, Lock Stl Split .375	6
10	010 910	Washer, Flat Stl SAE .375	3
11	601 838	Nut, Brs Hex .375-16 Jam Hvy	9
12	038 622	Block, Term 30A 5P	2
14	602 112	Screw, 010-24 X 1.25 Rnd Hd-slt Stl Pld	4
15	010 913	Washer, Flat Brs .218 ID x .460 OD x .031Thk	4
16	602 203	Washer, Lock .193ID X 0.334OD X .047T Stl Pld Split #10	4
17	601 861	Nut, 010–24 .38Hex .13H Stl Pld Blk	4

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Notes

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(Equipment with a serial number preface of MB or newer)

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Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Wireless Remote Foot/Hand Controls and Receivers
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

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1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

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Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

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Miller Electric Mfg. Co.
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

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USA Phone: 920-735-4505 Auto-Attended
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